

THE RUHR-LORRAINE INDUSTRIAL PROBLEM

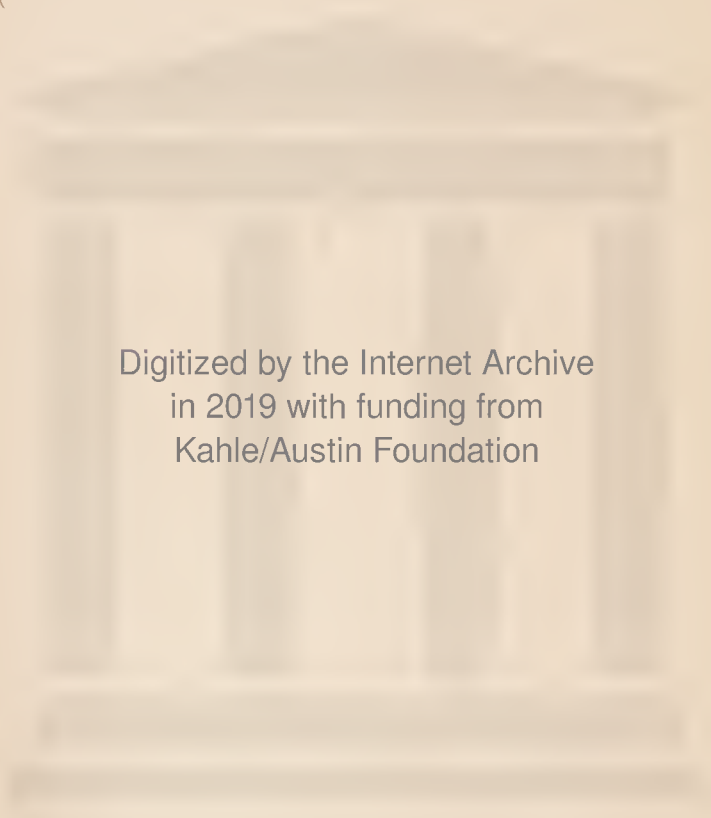
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THE INSTITUTE OF ECONOMICS
INVESTIGATIONS IN INTERNATIONAL ECONOMIC RECONSTRUCTION

THE RUHR-LORRAINE
INDUSTRIAL PROBLEM



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THE RUHR-LORRAINE INDUSTRIAL PROBLEM

A Study of the Economic Inter-Dependence
of the Two Regions and Their Relation
to the Reparation Question

BY
GUY GREER

WITH THE AID OF THE COUNCIL AND STAFF OF
THE INSTITUTE OF ECONOMICS

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DIRECTOR'S PREFACE

In this volume the Institute of Economics presents the fifth of its series of investigations in international economic reconstruction. The importance of the problem dealt with, lying as it does at the heart of the future economic relations of France and Germany, is self-evident and needs no emphasizing here. A highly integrated industrial system, which before the war supplied the bulk of the coal, iron, and steel consumed and used by the continent of Europe, has been torn asunder; and no new system has been or can be found to take its place. The old one will have to be reconstructed in some fashion or other, for the reason that the coal of the Ruhr and the iron ore of Lorraine remain where they were before, and still represent a most important part of the natural wealth of the European continent.

The author of this book was for a number of years after the war intimately associated with the problem of fuel distribution in Europe. First as a coal expert with the Peace Conference and later as Assistant Director of the Coal Bureau of the Reparation Commission, he was not only able to observe at close range the general situation of Europe with respect to the coal supply and the problems arising

out of the coal deliveries required of Germany by the Treaty of Versailles, but he was particularly well placed to study the peculiar problems created by the new Franco-German frontier separating the Ruhr and Lorraine.

The present study is concerned not so much with the complementary nature of the two great deposits of coal and iron as with the fundamental economic (and to a certain extent the political) situation created by the new frontier. For this reason the author has found it necessary to devote considerable space to what may be considered the economic and political setting of the problem. When he comes to discuss the future of the Ruhr-Lorraine system his purpose is to examine the various alternative policies that may be adopted by France and Germany in dealing with the problem which confronts them and clamours for solution.

H. G. MOULTON,
Director.

Washington, D. C.,
July, 1925.

AUTHOR'S ACKNOWLEDGMENTS

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As a former member of the technical staff of the Reparation Commission the author desires to express his indebtedness to the General Secretary of that organization for permission to use private notes and official records in the preparation of Part II. Special thanks are also due to Mr. George P. Auld, former Accountant General of the Commission, who has read the manuscript and offered valuable criticisms and suggestions.

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INTRODUCTION

Among the many and varied problems arising out of the war and the peace settlement, none is more intimately related to the future material welfare of the people of Europe than the situation created by the enhanced economic significance of political frontiers. By 1914 the economic organization of Europe and the world had attained a degree of practical internationalism that was hardly suspected until the upheaval of the Great War furnished a spectacular demonstration of the interdependence of nations. In the pre-war period political frontiers had, of course, some economic significance; but the world of industry and commerce was steadily approaching a state of international organization that might, without serious exaggeration, be described as economic unity.

At the end of the war certain political frontiers were changed and a number of new ones were drawn. These changes in themselves, however, might have had economic consequences of only minor importance, provided the same degree of economic internationalism as existed before the war had been maintained. But unfortunately, the extraordinary increase in nationalistic sentiment engendered by

four years of warfare brought about a radical change in the nature of national frontiers. The difficulty of re-establishing among the nations of Europe and the world those normal economic relations that are universally admitted to be necessary before reconstruction can be accomplished, has arisen, partly, it is true, from the creation of new frontiers, but mainly from the fact that the different nations have attempted to secure economic self-sufficiency by the erection of tariff walls and other barriers to the free exchange of goods.

Measures dictated primarily by the exigencies of politics have cut across the organization built up in Europe through generations of comparatively free economic development. The result has been that the normal interchange among the nations, of raw materials on the one hand and of finished products on the other, has not yet been re-established. Throughout the entire European industrial system there has been a decrease in productive activity, while at the same time no small difficulty has been encountered in finding markets for the industrial output, notwithstanding its reduced volume and in spite of the manifest need of European countries for industrial products.

A striking example of this state of affairs is furnished by the dislocation and partial paralysis of the iron and steel industry in western Europe. The great industrial agglomeration centering around the coal of the Ruhr and the iron ore of Lorraine has been

rent in twain. This has been brought about not so much by the new Franco-German frontier—since a large part of the Lorraine ore was separated from the coal of the Ruhr by the old frontier—as by the increased economic importance attached to political frontiers in general. Herein lies the crux of the Ruhr-Lorraine industrial problem. It can be definitely and permanently solved only when the conditions responsible for its existence have been fundamentally altered.

The Ruhr-Lorraine industrial problem is complicated by the reparation question, which is, willy-nilly, entangled with it. For the present, at least, it is impossible to consider the one except in relation to the other. A temporary arrangement, a sort of *modus vivendi*, has been effected in connection with the reparation plan of the Expert Committees, but the great industrial and economic problem has not been solved. The temporary arrangement is of value chiefly because it provides a period of delay during which a more permanent solution can be sought.

To an extent that is too little realized the problem is an international one, of world-wide scope. Superficially, only France and Germany are concerned, but in reality the industrial organization based on the great deposits of coal and iron of the Ruhr and of Lorraine constitutes the industrial heart of Europe. Upon the regular functioning of this great agglomeration of industries depends in a large measure the prosperity, not only of Europe, but of all the

countries in the world that trade with Europe. The Ruhr-Lorraine problem is not only more than a French or a German problem; it is more than a Franco-German problem. In the broadest meaning of the term, it is a world problem.

It is the purpose of this book, not to propose a complete solution of the Ruhr-Lorraine industrial problem, but to discuss and analyze its elements. Some suggestions of a general nature will follow naturally from the analysis, but the chief hope of the author is to contribute something to a clearer understanding of the conditions out of which the problem arises and the elements which must be taken into account in any practicable attempt to solve it.

Part I is designed to set forth the basic economic facts and tendencies of the coal and iron industries in Western Europe, as they existed before the war and as they still exist, in spite of the political changes of the peace settlement. This part of the work does not purport to include a complete discussion of all the manifold phases of the industrial development of the Ruhr and Lorraine regions. An attempt is made merely to bring out the salient facts of the situation, and in particular such facts as seem most likely to have a bearing on the future of the Ruhr-Lorraine industrial system.

Part II is devoted to an analysis of the situation arising out of the war and the peace settlement, both with respect to the productive organization in the Ruhr-Lorraine region and in relation to the

wider economic organization of which the Ruhr-Lorraine system has been in the past an integral part. In general terms the discussion has to do with the distribution of fuel in Europe during the years immediately following the end of the war. More specifically, it deals with the coal and coke demanded and received from Germany on the reparation account, both as compensation in kind for the damages suffered by the Allies in the war and in the interest of general reconstruction.

We shall see in effect that the task imposed upon the Peace Conference and the Reparation Commission was not only two-fold, but that the two ends sought—reparation and reconstruction—were in frequent conflict. Moreover, the conflict is still in existence and will continue to exist so long as the reparation question continues to play an important part in the economic life of Europe. The essential purpose of Part II, therefore, is first, to examine the manner in which the efforts made to secure reparation payments have often run counter to the fundamental requirements of the European economic system, and second, to obtain from our analysis a more comprehensive understanding of the Ruhr-Lorraine industrial problem in its proper setting as a vitally important part of the broader problem of European reconstruction.

In Part III an attempt is made to envisage the future possibilities of the Ruhr-Lorraine system in the light of the basic economic facts as set forth in

Part I and of the new situation following the war. The problem is analyzed from three separate and distinct points of view, namely, the French national, the German national, and the essentially economic point of view, which is international in the same sense that the world was tending towards economic internationalism before the war. Finally, an examination is made of the three alternative methods that may be applied in seeking a solution. Those three methods are, first, an attempt on the part of France and Germany to maintain in relation to each other the maximum degree of independence; second, a resort to political pressure by either or both countries; and third, the fullest possible Franco-German co-operation.

PART I
THE ECONOMIC BACKGROUND

THE RUHR-LORRAINE INDUSTRIAL PROBLEM

CHAPTER I

COAL AND IRON IN THE EUROPEAN ECONOMIC SYSTEM

Coal and iron are the twin foundations of industrial civilization. This general statement of a fact long familiar to economists and engineers has become, since the Great War, a commonplace, repeated and amplified by professional writers, politicians, newspaper reporters, editors, and publicists of all kinds. What is perhaps not so well known or so widely realized is the overwhelming importance, in this combination, of coal.

Coal is irreplaceable in the process of satisfying two basic requirements of industrial civilization. These requirements are, first, for iron and steel, and second, for power. In the production of iron, coal has a distinct chemical rôle that cannot be played on a scale commensurate with modern industrial requirements by any other substance. The reduction of iron ore to metallic iron requires large quantities

of burning carbon ¹ in contact with the oxide of iron which composes the ore, and no substitute for coke (which is coal with the gaseous matter distilled off) has ever been discovered for use on a large scale.

It has been estimated by Eckel ² that from 80 to 85 per cent of all the mechanical and electrical power consumed in the world, as distinct from literal man-and horse-power, is derived directly or indirectly from coal. This is true, moreover, in spite of all the hydro-electric plants in the world and all the automobiles burning gasoline. Writing in 1920, Mr. Eckel declares: “. . . It is still safe to say that if the entire petroleum supply of the world were to be shut off completely today, it would mean that we would have to increase our coal mining by some 8 per cent at the most to replace the missing product in technical efficiency.” ³

Hydro-electric plants will no doubt continue to be an increasing source of power supply. Water-power is not likely to replace coal, however, for the reason that there is not and probably never will be enough of it available. It will furnish an important supplement to the power derived from coal, but it is never-

¹ This is equally true in the case of electric smelting, although the source of the carbon is not necessarily coal. Charcoal is usually employed, but it is difficult to see how any great quantity of iron can be produced by this method in competition with the modern blast furnace using coke.

² Eckel, Edwin C., *Coal, Iron and War*.

³ *Ibid.* It should be noted, however, that it would be exceedingly difficult to replace oil as a lubricant, owing to the fact that liquid fuels derived from coal contain only negligible quantities of lubricating oils.

theless safe to assert that there is much greater probability of the development of some new or now unutilized source of power, such as the heat from the earth's core, the energy of the tides, the rays of the sun, or even the energy of the atoms, than that water-power will replace coal.

It is widely accepted as axiomatic that in the metallurgical process iron goes to coal. What is meant by this somewhat loose generalization is that iron in its cruder forms is usually transported to a coal producing region to be worked up into finished products. Thus iron ore usually goes to coal. The reason is not, however, that a greater tonnage of coal or coke than of ore is required in the process of smelting iron. The reverse is in fact the case, for in modern practice the weight of the iron ore in the blast-furnace charge is usually from 1.75 to 2.5 times greater than the weight of the coke.⁴ The real reason that iron ore is usually transported to a coal producing region lies in the fact that the economical utilization of the blast-furnace output, for the manufacture of finished iron and steel products, requires large quantities of low-priced power, which are to be found most conveniently in or near a coal producing district.

Iron ores of workable grade are so widely distributed throughout the world that they are usually

⁴For example, Germany in 1913 consumed 38,834,000 tons of iron ore and 19,124,000 tons of coke in her blast furnaces, which produced 16,764,000 tons of pig iron. *Vierteljahrshefte zur Statistik des Deutschen Reichs*. 25 Jahrgang, 1916, Drittes Heft, p. 19.

obtainable wherever there exists a coal supply of the requisite quantity and quality for the development of an iron and steel industry. Moreover, the reserves of iron ore, notwithstanding the enormous quantities that have been discovered and carefully surveyed, are much less completely known than are the coal resources of the world. The probability of discovering additional deposits is therefore greater in the case of iron ore than in the case of coal.

Iron ore, however, is not invariably transported to a coal producing region. Sometimes, where no customs barriers interfere and where the ore is of low grade and the distance is not too great, it is more economical first to ship coal or coke to the iron mines and then to carry back to the coal producing region pig iron and crude steel as well as iron ore. An example of this is furnished by the arrangement existing before the war between the Ruhr district and the Lorraine region. In other cases, the iron ore and the coal meet at some intermediate point, as in Gary, Indiana. The axiom that iron goes to coal remains true as a loose generalization, but it must not be applied too rigorously.

It is nevertheless true that the possession of abundant coal carries with it the possibility of an industrial development great enough to permit a country to purchase abroad as much iron ore as it requires. All the great centers of iron and steel production in the world lie in the vicinity of the great coal fields, and these are also the great centers of industrial

production in general. Certain countries—Brazil, Newfoundland, Sweden, Spain, North Africa, for example—are bountifully supplied with iron ore, but possess little or no coal, and none of them ranks high in industrial output. Such countries as the United States, Great Britain, and Germany,⁵ possess large coal resources, and their leadership in modern industrialism is too well known to require comment.

There are in the world only a few great natural centers of iron and steel production. This is true because there are only a few regions on the earth's surface where the requisite qualities and quantities of coal and iron ore are found near enough together to permit of their efficient use in combination, and where in addition the coal supply is large enough to make possible a great center of industrial activity in general.

At present, considered solely with respect to geographical location and without regard to national frontiers, there are but two such centers, both in the northern hemisphere and contiguous to the opposite shores of the Atlantic Ocean. One is in the United States east of the Mississippi River; the other in western Europe—in Great Britain and on the continent. It is conceivable that there may be developed at some future time in eastern Asia another,

⁵Great Britain and Germany are both large importers of iron ore. The latter country, even in 1913 when the ores of German Lorraine and Luxemburg were available, imported about 14,000,000 tons, mostly from Sweden, Spain and France. See table in Chapter II, p. 48.

comparable to the two which exist at present, and possibly a certain number of less important centers in various other parts of the world. In any case, however, it may be safely asserted that the bulk of the future iron and steel supply of the world must come from a limited number of producing regions.

The accompanying table (p. 10) shows the coal resources of the principal countries of the world, and the reserves of iron ore, so far as they are known. It will be observed that China possesses enormous quantities of coal. The most important deposits lie in the northern part of that country, and the coal is known to be of excellent quality for conversion into coke. It is probable, also, that abundant reserves of workable iron ore will be discovered in China and in eastern Siberia when those vast territories are thoroughly surveyed. Eastern Asia, therefore, may eventually become a third great center of iron and steel production and of industrial activity.

Canada has enormous coal reserves, which lie for the most part in the western provinces of the Dominion. However, a large proportion of this coal (about three-fourths) is lignite,⁶ a low-grade fuel not suitable for use in iron production, and the remainder is for the most part a rather poor quality of bituminous. In certain other countries, notably Russia, Australia, South Africa, India, and Colombia, are to be found fairly large coal reserves, and prob-

⁶ Lignite has only from one-fourth to one-half the heating value of bituminous coal. It is usually too friable to stand shipment and contains from 30 to 60 per cent of moisture.

ably abundant iron ore. It may be expected, therefore, that some of these regions will eventually become important industrial centers, but they are not likely to compare in extent and volume of output with the United States or western Europe, or with the potentialities of eastern Asia.

The iron and steel industry is a basic element in the economic structure of modern Europe. The world-wide industrial expansion which began in the latter half of the nineteenth century was coincident with the greatly increased capacity for steel production which followed the invention of the Bessemer converter.⁷ This was particularly true in Europe. Abundant steel made possible a great expansion of transportation facilities, both by land and sea. Population increased and the demand for iron and steel products of all kinds was enormously expanded. Europe came to depend more and more upon imports to supply the need for food and clothing of her industrial population, and those imports were paid for by the export of manufactured products, either made directly of iron and steel or with the aid of machinery constructed of iron and steel. The production of iron and steel, therefore, has come to represent a general index of prosperity.

Great Britain was the first European country to become a great industrial nation, chiefly because she

⁷The Bessemer converter was invented about 1850. It made possible the immediate conversion of pig iron into steel on a scale as great as the output of the largest blast-furnace. See Chap. II, p. 34.

COAL AND IRON STATUS OF THE NATIONS IN 1913
In Millions of Metric Tons

Countries	Coal (a)		Iron (b)		
	Re-serves	Pro-duction, 1913	Ore Reserves	Production in 1913	
				Iron Ore	Pig Iron
United States (c).....	3,838,657	517.0	4,257 (h)	62.9	30.7
Canada (d).....	1,234,269	13.7	Probably Enormous	0.3	1.0
Total, North America....	5,072,926	530.7	4,257+ (?)	63.2	31.7
Germany (e).....	423,356	277.0	3,362	28.6	16.8
Great Britain (f).....	189,533	287.0	1,300	16.2	10.3
France (g).....	17,583	40.8	3,300	21.9	5.2
Sweden	114	0.4	1,158	7.5	0.7
Spain	8,768	4.3	711	9.8	0.4
Belgium	11,000	22.8	62	0.1	2.5
Luxemburg .....	...	...	245	7.3	2.5
Holland	4,402	2.0	...	...	...
Total, Western Europe....	654,756	634.3	10,138	91.4	38.4
China	995,587	14.0	Probably	0.4	...
Siberia	173,900	2.2	Enormous	...	...
Total, Eastern Asia.....	1,169,487	16.2	Probably Enormous	0.4	...
Russia (In Europe).....	60,100	33.8	630	9.5	4.5
Australia	165,572	12.6	136+ (?)	0.1	...
South Africa.....	56,200	8.0	Probably Enormous	...	...
India	79,001	16.5	100+ (?)	0.4	0.2
Colombia (So. America)...	27,000	...	Considerable	...	...
Austria-Hungary	59,269	55.0	283	5.3	2.4
Japan	7,970	21.6	55	0.2	0.2
Brazil .....	...	...	5,710	...	...
Newfoundland	500	...	3,635	1.5	...
North Africa.....	....	...	125	1.9	...
Italy	243	0.7	6	0.6	0.4
All others.....	44,544	13.2	235+ (?)	0.1	1.3
Grand Totals.....	7,397,568	1,342.3	25,310+ (?)	175.0	79.1

possessed important deposits of coal and iron practically side by side and near the sea. A large part of her iron ore yielded a grade of pig iron so free from phosphorus that it was well adapted for use in the most elementary form of the Bessemer converter.

On the Continent the principal deposits of iron ore are farther removed from the coal fields than in Great Britain, and most of them, particularly those in Lorraine and in Sweden, contain phosphorus in such quantities as to render their pig iron unfit for use in the simple Bessemer process. This combination of adverse conditions was sufficient to retard for a generation the industrial development of the Con-

(a) Coal reserve figures taken from *Coal Resources of the World*, Twelfth International Geological Congress, Toronto, 1913. They include *known* and *probable* reserves of both coal and lignite. Production figures from a compilation in *Jahresbericht der Aktiengesellschaft Reichskohlenverband 1923-1924*.

(b) Iron ore reserve figures taken from *Iron Ore Resources of the World*, Eleventh International Geological Congress, Stockholm, 1910, except for Brazil, for which an estimate used by Eckel is taken. The figures are for *actual reserves*, since the *probable* tonnages are not generally well known. Production figures from the various statistical publications of the countries concerned.

(c) The coal reserves are about one-third lignite.

(d) The coal of Canada is about three-fourths lignite.

(e) *Frontiers of 1913*. Coal reserves are only about 3 per cent lignite, although the production of lignite in 1913 amounted to 87,000,000 tons, or 31 per cent of the total output.

(f) Potential reserves of iron ore given as 37,500,000,000 tons, although most of this is of very low grade.

(g) Within the frontiers of 1913.

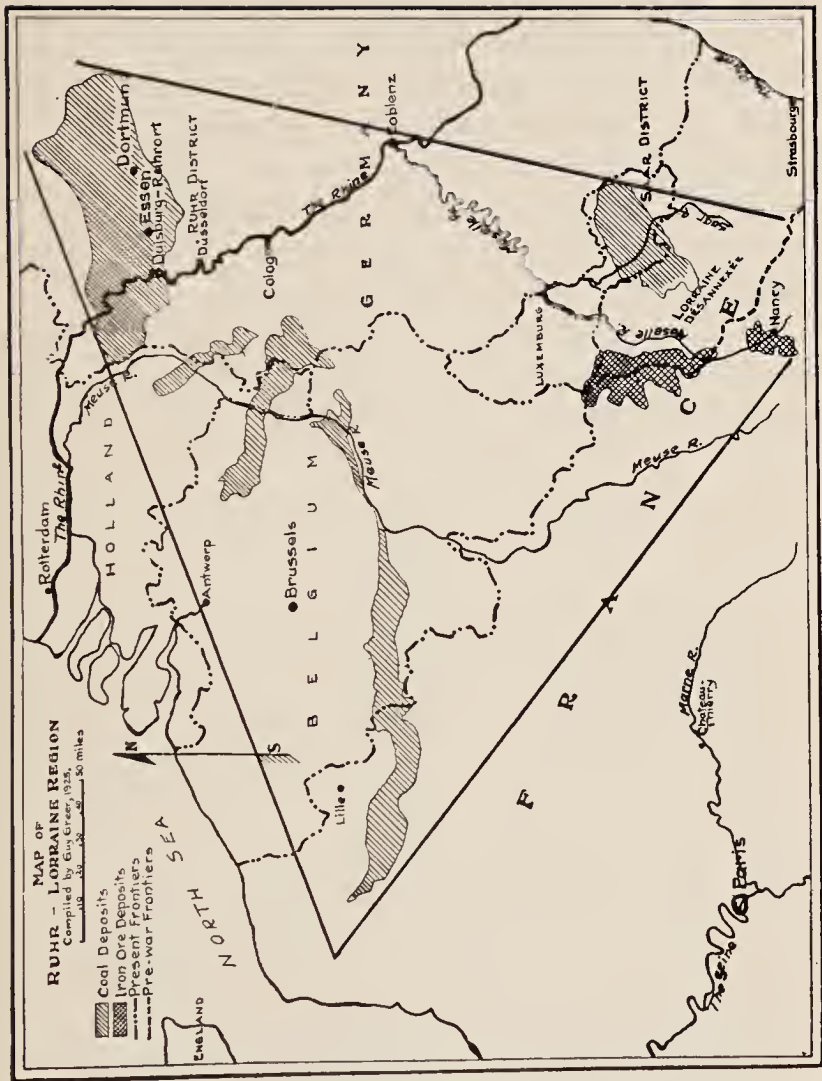
(h) The figures given of the iron ore resources of the United States do not present an accurate picture of the situation. The *potential reserves* are given as 75,105,000,000, but in reality a large proportion of these are *known*; and the quality of the ore is so high that it may be safely asserted that the United States possesses more than half of all the known workable iron ore in the world.

tinental countries. Then the basic Bessemer or Thomas process⁸ was invented, and the iron ores containing phosphorus became available for steel making.

Shortly after the Franco-Prussian war Germany began the development of a great iron and steel industry. Transportation facilities were provided between the coal fields of the Ruhr and the iron ore deposits of Lorraine; imports of ore from Sweden and Spain were increased; and the great industrial expansion that has characterized modern Germany was begun. To a lesser degree a somewhat similar development was taking place in France, Belgium and Luxemburg, and the industrial system centering around the coal of the Ruhr and the iron ore of Lorraine came into being as the chief corner-stone of the economic structure of Continental Europe.

The Ruhr-Lorraine system may be defined as the integrated industrial organization existing at the outbreak of the Great War in that relatively small area of western Europe which includes western Germany, northern France, Belgium, and Luxemburg. It will be observed from an inspection of the accompanying map (p. 13) that the territory is roughly triangular in outline. What might be arbitrarily defined as the base of the triangle lies in the Rhineland, extending from a point a little northeast of Dortmund in Westphalia, southward in the

⁸ A brief description of this process will be found in Chap. II, p. 35.



general direction of the Rhine and the Moselle rivers, taking in the Saar coal field and ending somewhere between Strasbourg and Nancy. The two legs of the triangle would then meet at a point near the English Channel in northern France. The total area of the region is hardly as great as that of the state of Vermont, but the quantity and quality of its coal and iron deposits are such as to make of it the industrial heart of Continental Europe.

The iron and steel industries of Great Britain and of the Ruhr-Lorraine system have necessarily been competitors in the markets of the world. In the broader economic sense, however, the development of both Great Britain and the Continental countries has been facilitated by their economic inter-dependence. While they have been competitors in the production and marketing of certain iron and steel products, they have been at the same time, in many fields of their larger industrial activity, the best customers of each other. All Europe, until the Great War interrupted the process, was being welded together into a great economic unit, the material foundations of which were coal and iron.

Western Europe is the normal source of supply for about half the iron and steel consumed in the world. This is true because the system of production and distribution of goods in vogue before the war was the result of unhampered economic growth. In 1913, five countries—Great Britain, Germany, France, Belgium and Luxemburg—produced 47.5 per cent of the

world's output of pig iron. In the same year, the United States produced 39.3 per cent. These countries occupied similar relative positions as producers of the world's supply of industrial goods.

The population and the trade of the world have kept pace with the growth of industrial activity, and the ability of large groups of people to secure a livelihood has come to depend upon the continuation of a similar rate of production and exchange of goods.

Since the war, the relative position of the United States and western Europe as producers of iron and steel has been reversed. Whereas, in 1913 North America (the United States and Canada) produced 41 per cent of the world's output of pig iron and 43 per cent of the output of steel as against 49 and 46 per cent, respectively, for the west-European group, the average production for the five-year period 1920-1924 was approximately as follows: North America 56 per cent of pig iron and 57 per cent of steel; west-European group, 38 per cent of pig iron and 35 per cent of steel.⁹ In 1924 the percentages were: North America 49 per cent, and western Europe 44 per cent for pig iron; and North America 52 per cent, and western Europe 40 per cent for steel.

The following tables, showing the pig iron and steel output of the principal countries of the world, will indicate something of the change which has taken place since the war.

⁹ For detailed figures, see tables on pp. 16-17.

PIG IRON AND STEEL (INGOTS AND CASTINGS) OUTPUT OF THE WORLD.*
Thousands of gross tons (2,240 lbs.)

Pig Iron

Countries	1913	1920	1921	1922	1923	1924
United States	30,653	36,401	16,506	26,851	40,026	31,000
Canada	1,015	999	617	404	909	700
Total	31,668	37,400	17,123	27,255	40,935	31,700
Percentage of World Output	41	64	50	53	62	49
Germany	19,000	5,568	6,096	8,000	4,400	8,200
Great Britain	10,260	8,035	2,616	4,902	7,440	7,400
France	5,126	3,380	3,308	5,147	5,346	7,500
Sweden	730	477	304	255	273	300
Spain	418	248	175	175	394	400
Belgium	2,428	1,099	862	1,578	2,154	2,800
Luxemburg	^a	682	955	1,650	1,384	2,125
Total	37,962	19,489	14,316	21,707	21,391	28,725
Percentage of World Output	49	33	41	42	32	44
All Others.....	7,552	1,965	3,261	2,976	4,145	4,205
Grand Total.....	77,182	58,854	34,700	51,938	66,471	64,630

* Compilation published in the *Iron Trade Review* of Jan. 1, 1925, p. 41. Some of the figures are manifestly estimated—for example, those of the year 1924, and the German output for the years 1921 to 1924, since official figures were not published until after Jan. 1, 1925. Moreover, this table is not to be compared with the data appearing in subsequent chapters of this book, owing to the fact that figures are in *gross* instead of *metric* tons; it is reproduced here only for the purpose of showing the general situation with respect to world output of iron and steel.

^a Included in Germany.

It will be observed that while there has been a general decline in pig iron production in western Europe the most serious decrease has occurred in the Continental countries. This is due to the fact that the Ruhr-Lorraine system has not resumed its

PIG IRON AND STEEL (INGOTS AND CASTINGS) OUTPUT OF THE WORLD.
Thousands of gross tons (2,240 lbs.)

Steel

Countries	1913	1920	1921	1922	1923	1924
United States.....	31,301	42,133	19,744	33,603	44,944	37,800
Canada	1,043	1,109	669	485	885	725
Total	32,344	43,242	20,413	34,088	45,829	38,525
Percentage of World Output	43	64	48	54	61	52
Germany	18,631	6,624	8,700	9,000	5,900	8,500
Great Britain.....	7,664	9,067	3,703	5,881	8,482	8,400
France	4,614	3,002	3,010	4,464	5,029	6,850
Sweden	582	430	203	343	294	400
Spain	381	150	100	250	453	475
Belgium	2,428	1,233	780	1,539	2,250	2,850
Luxemburg	^a	561	747	1,368	1,182	1,850
Total	34,300	21,067	17,243	22,845	23,590	29,325
Percentage of World Output	46	32	41	36	31	40
All Others.....	8,375	2,836	4,831	6,165	5,677	5,725
Grand Total.....	75,019	67,145	42,487	63,098	75,096	73,575

^a Included in Germany.

normal function in the economic structure of Europe. The regular interchange of raw materials and of finished products among the various regions and countries has not yet been re-established. It is this state of affairs which gives rise to the Ruhr-Lorraine industrial problem.

CHAPTER II

THE RUHR-LORRAINE SYSTEM—THE MATERIAL FOUNDATIONS

The agglomeration of industrial centers sprawling over western Germany, northern France, Belgium, and Luxemburg, constitutes essentially one great economic unit. Its geographical form has been crudely described as triangular, but even when it is specifically stated that the greater part of the base of the triangle lies in the Ruhr and Rhineland, the image suggested is inadequate to convey any impression of the relative importance of the component parts of the industrial system that has been built up in this region. Certain centers are much more highly developed than others; the valley of the Ruhr in Westphalia, for example, in the northeast corner of the area, is more important from the standpoint of industrial output than all the rest of the triangle. This fact is readily understood when it is considered that the largest and best supply of coal on the continent of Europe is located here.

In very general terms the coal supply of the region is unevenly distributed along the northern side of the triangle. An examination of the map on p. 13 above shows a chain of loosely related deposits ex-

tending from the great Westphalian basin westward, through Holland, Belgium, and France, to within a short distance of the English Channel. In the opposite corner are the great Lorraine iron fields and the Saar coal basin. Spread out along the base of the triangle are the great industrial centers of the Ruhr and Rhineland and the highly developed transportation system welding together the Ruhr and Lorraine. The third side of the figure, extending from a point in northern France to the Lorraine region, is not very clearly defined, but the triangle thus completed encloses an area which in the intensity of its activity is one of the most highly developed centers of industrial and economic life in the world.

Some idea of the importance of this territory to the industrial organization of Europe might be obtained by comparing it with the great coal and iron producing regions of America. Let us suppose a block of territory comprising the states of Pennsylvania, West Virginia, Ohio, Indiana, Michigan, Wisconsin, Minnesota, Kentucky, Tennessee and the northern half of Alabama. This area, though enormously greater in extent, means to industrial America about what the Ruhr-Lorraine system means to the continent of Europe.

But perhaps a less imperfect impression of the relative importance of the component parts of the Ruhr-Lorraine system might be obtained if we return to geometrical figures and imagine a very

irregular pyramid¹ constructed upon the triangle described above, but with its apex approximately over the city of Essen in the Ruhr. Such a structure, if we should attempt to design or model it, would be top-heavy on the north, and would probably furnish material for a cubist nightmare, but it might convey some impression of the manner in which the great coal, iron and steel industry of western Europe has been built up. Then if we consider that this pyramid of industrial activity represents a source of prosperity and a means of livelihood for a large part of Europe, something of the importance of the Ruhr-Lorraine region in the economic organization of the modern world may be realized.

I. THE RAW MATERIALS

The Ruhr-Lorraine² industrial system is made possible by a felicitous combination of natural conditions—by the existence of abundant quantities of coal and iron near enough together to be used in combination. The coal of the Ruhr and the iron ore

¹In an article in the *Paris Temps* (February, 1924) M. Paul Reynaud has described the industrial system of western Germany as a pyramid, the base of which is the coal of the Ruhr and the apex an electric lamp.

²*Geographical note:* The term, "The Ruhr-Lorraine System" refers in a very general way to the following regions (see Map on p. 13): Westphalia (the Ruhr) and the Rhineland; the Saar Territory; Lorraine désannexée (former German Lorraine); French Lorraine; Luxemburg; Belgium; Northern France. "The Lorraine Region" refers to both French Lorraine and Lorraine désannexée and to Luxemburg, that is, to the territory producing iron ore.

of Lorraine form the chief material basis upon which the system is built.

These two great mineral deposits taken together constitute a vastly important part of the natural wealth of the continent. They are separated by a distance of less than 150 miles, and the development of a highly efficient transportation system welding them together and giving them access to the markets of the world has been an easy and natural accompaniment to the growth of the industrial organization of western Europe.

The Ruhr basin possesses both the largest coal reserve on the continent of Europe and the best coking coal. Since all coals will not produce coke of the quality requisite for use in the modern blast-furnace, this latter characteristic of the Ruhr deposits is a matter of extreme importance. The reserves in the Westphalian basin have been estimated at 213,566 million tons,³ and probably as much as 50 per cent of this coal is suitable for coking. (Of the mines now in operation about 60 per cent of the production is of coking quality.) At the rate of production of 1913 there is enough coal here to last nearly 2,000 years.

West of the Ruhr basin the coal fields become much less regular. In Germany, west of the Rhine and north of the Moselle, the reserves have been estimated at 10,458 million tons, and the little southern extension of Holland known as the Lim-

³ *Coal Resources of the World.*

burg district contains 2,372 million tons. The reserves of Belgium have been estimated at 11,000 million tons, and those of northern France at 12,160 million tons.⁴ If France and Belgium should maintain their 1913 rate of production their total coal reserves would be sufficient for about 500 years. All these deposits are a westward extension of the Westphalian coal bearing strata and are of about the same geologic age. If it be assumed that the percentage of coking coal is the same throughout the region, the Ruhr basin has over 85 per cent of the total coke producing capacity. In reality there is reason to believe, on the basis of the mines now in operation, not only that the coal is of inferior coking quality, but that the percentage of coking coal in Belgium and northern France is considerably lower.

After the Ruhr, the Saar basin contains the most extensive coal deposits of any single district in western Continental Europe. The known reserves have been calculated as being 16,548 million tons,⁵ but the boundaries of the Saar field are not very well known on the west, and the reserves are probably extensive. No estimate is available of the quantities likely to be found in the field extending outside the mining district into what is now French Lorraine. A large part, perhaps half, of the Saar coal can be used for making coke, but the product is of poor quality. The yield is low in comparison with the Ruhr coal and the coke is hardly strong enough for efficient use

⁴ *Ibid.*

⁵ *Ibid.*

in blast-furnaces. However, if about 20 per cent of Westphalian coal be mixed with the Saar product the result is a coke that can be successfully used for smelting iron. The best results are obtained in practice by mixing equal quantities of Saar and Westphalian coke in the blast-furnace charge. It has been calculated that the value of the Saar coking coal for furnace use is only 62 per cent of the value of an equal quantity of Ruhr coal.⁶

The coking coal of the Ruhr is of great value apart from its use in the iron and steel industry. The conversion of coal into coke is attended by the recovery of important by-products which provide the raw materials for a group of great industries. The chief products of such conversion, after coke itself, are coal tar, ammonia and benzol. The coal tar, with its almost infinite number of derivatives, has furnished the basis for the great chemical and dye industries of Germany, a large number of which are in the Rhineland, between the Ruhr and Lorraine. Drugs and pharmaceutical products of almost every description; perfumes; flavoring extracts; aniline dyes of a thousand shades and gradations of color; explosives and gases; such are only a few of the multitude of valuable substances derived from coal tar. Ammonia, in the form of a sulphate, is a valuable fertilizer. In addition it is a source of nitrogen which may be used for various manufacturing pur-

⁶ See *Iron and Associated Industries of Lorraine, Sarre, Luxembourg and Belgium*, by Brooks and La Croix, Bulletin 703, U. S. Geological Survey.

poses, particularly for making explosives. Benzol is a highly volatile liquid fuel, furnishing more power per unit of weight than gasoline, and is extensively used by motor vehicles.

In the year 1913 the coke produced in Germany amounted to 34,630,000 tons, which was worth at market prices about 607,000,000 marks. The value merely as raw materials of the by-products of the coking process amounted to 179,147,000 marks.⁷ The greater proportion, approximately 84 per cent, of these by-products were produced in the Ruhr and Rhineland from Ruhr coal, and they supplied the elements by means of which Germany became the most important producer of chemicals and dye stuffs in the world.

The bulk of the iron ore of western Europe is concentrated in northeastern France. The Franco-German frontier established after the war of 1870 was designed to include practically the whole of the Lorraine basin in Germany, and it was due to a failure on the part of Bismarck's geological advisers to understand the nature of the deposits that over half the iron ore was left on the French side.⁸ And now, since the World War, practically the entire basin has been returned to France. In this region is concentrated about 47 per cent of the metallic iron reserve of the Continent and 42 per cent of the

⁷ *Vierteljahrshefte zur Statistik des Deutschen Reichs, 25 Jahrgang, 1916, Drittes Heft.*

⁸ For a description of this misunderstanding, see Eckel, *Coal, Iron and War.*

known iron in workable ores of all Europe including Great Britain.

In terms of iron ore the total reserves of the Lorraine basin amount to 5,100,525,000 tons.⁹ All this is in France except 270 million tons in Luxemburg and some insignificant quantities in Belgium. France controls, therefore, about 95 per cent of the total reserves of the basin. The metallic iron in the ore varies from 25 to 48 per cent, the average for the entire region being about 31 per cent. The reserves in terms of metallic iron have been estimated at 1,608 million tons.¹⁰ Most of the ores lie in a practically solid block, extending from just north of Pont à Mousson to within the Luxemburg border and just touching the extreme southern edge of Belgium. South of this block lies an entirely detached basin around Nancy, containing ore reserves of about 200 million tons, of a somewhat lower grade.

The Lorraine deposits are differentiated from other iron ores by several characteristics. They are classified geologically as oölitic limonites, and commonly referred to as minettes.¹¹ In general their metallic iron content is very low as compared with other high-grade ores, which contain from 50 to 60 per cent and sometimes even more than 75 per cent

⁹ Brooks and Lacroix, Bulletin 703, U. S. Geological Survey.

¹⁰ *Ibid.*, 558,000,000 tons of this is in what was formerly German Lorraine.

¹¹ According to Laufenburger, H., *L'Industrie Sidérurgique de la Lorraine Désannexée et la France*, p. 22, the term *minette* was originally used to denote derision, *petite mine*, on account of the low iron content.

of iron, as against the average of 31 per cent for the Lorraine basin. This fact would be sufficient to place the Lorraine deposits in a very disadvantageous position, were it not for a combination of circumstances and certain characteristics of the ores. A large part of these ores contain from 10 to 20 per cent of limestone, which is a fluxing material used in blast-furnaces. Naturally, this is an advantage, since it eliminates the necessity of securing just that much limestone from other sources.

The most important feature of the Lorraine ores, however, is their high and fairly constant phosphorus content. This is present in the form of phosphorus pentoxide (P_2O_5), in proportions varying between 1.5 and 2 per cent. Phosphorus in steel renders the metal "cold-short," or brittle when cold, and therefore practically useless. Prior to the discovery of a simple method for eliminating this unwelcome element the Lorraine deposits were of relatively small importance in the metallurgical industry of the world. After the discovery of such a method they became one of the most valuable assets of the European industrial system, for not only did it become possible to make excellent steel from this ore, but the phosphorus itself, in the form of slag, furnishes a very valuable fertilizer as a by-product.¹²

Nature has been generous with this section of western Europe. There is enough iron in Lorraine to supply the needs of the Continent and a consider-

¹²See p. 35 of this chapter.

able part of the rest of the world for perhaps hundreds of years. There is in the Ruhr district coking coal enough to smelt this iron 40 times over and probably enough to smelt two or three times as much iron ore as there is in the whole world.

In the industrial organization of western Europe the coal of the Ruhr and the iron ore of Lorraine are complementary. Neither region can attain the full degree of economic development which its mineral wealth would make possible without the co-operation of the other. The available supply of workable iron ore in Continental Europe is limited. The bulk of the coal which is suitable for coke production is concentrated in a small area not far removed from the Lorraine ore. In no other region on the Continent are the basic raw materials of industrial development so well placed for use in combination, or so vast in extent, as in the Ruhr and Lorraine.

It has been estimated that not more than 2,500,000,000 tons of coking coal would be required to smelt the entire 1,600,000,000 tons of metallic iron in the Lorraine ores. France alone undoubtedly has more coking coal than this—although it is of inferior quality—in her northern mining districts; even Belgium probably has more than enough to smelt the entire ore reserves. Then why, we may ask, is the Lorraine ore dependent upon the Ruhr coal?

The answer is not far to seek. No country under present conditions of industrial organization, least of all a country not producing enough coal for its own

consumption, can afford to make coke of a very great percentage of its coal supply. The bulk of the available fuel must be used for power production. In the United States, for example, the consumption of coal (bituminous and anthracite) was distributed in 1917 as follows: power production (railways, manufacturing, shipping, public utilities, etc.), 69 per cent; domestic heating, 17.4 per cent; coke manufacture, 13.6 per cent.¹³ In the year 1913 in Great Britain the proportion of the coal consumption used for the production of coke amounted to approximately 13 per cent.¹⁴ In France the total consumption of coal in the same year was 58,376,000 tons, while the production of coke amounted to only 2,941,000 tons—the equivalent of approximately 3,921,000 tons of coal, or 6.7 per cent of her consumption.¹⁵ The remainder was used for general fuel purposes.

The situation in Germany, on account of the excellent coking quality of the Ruhr coal and the extensive demand for the by-products of the coking process, has been somewhat different. In 1913 the proportion of the coal available for consumption

¹³ U. S. Geological Survey, *World Atlas of Commercial Geology*, 1921, Part I, p. 14.

¹⁴ Total coal consumption (production plus imports, minus exports) amounted to 214,400,000 tons; coke production to 20,970,000 tons, which at the ratio of four tons of coal to three tons of coke required 27,796,000 tons of coal. *General Annual Reports and Statistics on Mines and Quarries*, 1913.

¹⁵ See table on p. 69, Chap. III. It should be noted that this figure for coke production does not include coke produced by metallurgical plants for their own use, which amounted in 1913 to about 1,000,000 tons.

which was converted into coke amounted to 27 per cent.¹⁶ But it should be remembered that Germany had available for her general fuel needs about 94,000,000 tons of lignite,¹⁷ in addition to the 163,000,000 tons of coal consumed. Moreover, she exported over 9,000,000 tons of coke, the greater part of which was supplied to France, Belgium and Luxemburg for the purpose of smelting Lorraine ore. But the chief reason for the transformation of a large percentage of the coal output into coke was the great demand in Germany for the by-products of the coking process for use in the extensive chemical and dye industries.¹⁸

Now that practically the whole of the Lorraine ores are in French territory and the bulk of the supply of coking coal remains in Germany, the very pertinent question arises as to what would be the result if the two great complementary deposits should not be used in co-operation. We must, however, resist the temptation to discuss this problem here,¹⁹ and continue to examine the Ruhr-Lorraine system of pre-war days.

¹⁶ *Vierteljahrshefte zur Statistik des Deutschen Reichs*, 25 Jahrgang, 1916, *Drittes Heft*, p. 14. See also table on p. 69, Chap. III, of this book.

¹⁷ See footnote on p. 11, Chap. I.

¹⁸ See p. 23, this Chapter. It should be noted that France and Belgium may also develop industries based on coal by-products and thus provide an incentive to the production of more coke; but under such conditions they will be obliged either to use coke as ordinary fuel for power purposes or to import increased quantities of coal.

¹⁹ See Chapters IX and X.

II. THE ELEMENTS OF THE METALLURGICAL PROCESS

In order to obtain a more comprehensive understanding of the industrial organization that has grown up in western Germany, northeastern France, Belgium and Luxemburg, it will be well to keep in mind the essential processes involved in the conversion of Lorraine iron ore into steel. For the benefit of the reader who is not familiar with the technical operations involved, therefore, a brief description (in non-technical language) will be given.

Coke, iron ore, and limestone are the necessary elements in iron production. The coke must be first of all porous enough to burn, and, what is even more important, it must be hard and strong enough to support an enormous dead weight. Also it should be in fairly large pieces and should contain a large percentage of fixed carbon, both for heating and chemical purposes. The iron ore should obviously contain as large a proportion of metallic iron as possible, although under modern conditions of large scale production this proportion is not so important as formerly. Within certain limits other factors are sufficient to compensate for a relatively low iron content, as pointed out above in connection with the distinctive features of the Lorraine ores.

The modern blast furnace is named a *haut fourneau* in French and a *hochofen* in German. The terms are very descriptive, for it is indeed a high furnace. It is a tall cylinder-like structure, often

from 80 to 100 feet high and 20 to 25 feet in diameter at the largest part, which is some 20 or 25 feet from the base. It tapers slightly to a smaller diameter at the top, thus having somewhat the appearance of a huge vase. It also resembles an enormous barrel standing on end, with the upper portion (above the bulge) greatly elongated. At the base, which is of smaller diameter than the largest part, are openings, called *tuyères*, for the purpose of supplying air. Reduced to its most elementary terms, this is a blast furnace. Some idea of its size, apart from its mere dimensions, may be had from the fact that it turns out from 400 to 500 tons of pig iron every 24 hours.

The charge is composed of coke, iron ore, and limestone. These materials are poured in from the top in carefully weighed proportions and evenly mixed together from near the bottom of the furnace to the top. Then the mixture is fired from the bottom. In modern practice very hot air is forced in through the *tuyères*. The dead weight on the bottom layers of this material can well be imagined; and it is easy to understand why the coke must be hard and strong, for otherwise it would be crushed to powder and so tightly packed that sufficient draft could not be obtained to cause the mixture to burn. In the Lorraine deposits, the iron ore itself contains a certain amount of limestone, and the proper proportions in the charge are maintained by adding more when necessary. The rôle of the limestone is merely passive—that of a catalyzer; it facilitates the melting of the

iron. In general the proportion of limestone varies with the silica content of the ore and the ash content of the coke.

The iron ore is composed of an oxide of iron ²⁰ and certain non-metallic materials. When the whole mass reaches a high temperature, the carbon in the coke unites with the oxygen in the iron oxide and the molten metal runs down to the bottom of the furnace. This is essentially what happens, although the chemical operations are somewhat more complicated. When a sufficient quantity of molten metal has collected at the bottom, the furnace is tapped and the mass of metal and slag is drawn off. More coke, ore and limestone are dumped in at the top and the process goes on indefinitely.

It is clear that the coke plays a chemical rôle in addition to supplying the necessary heat. The goal of technical progress has been to achieve a process wherein only the quantity of coke necessary to combine with the oxygen in the iron ore is required in the blast-furnace.²¹ In the case of the Lorraine ore the weight of the coke represents, under the best modern conditions, from 35 to 40 per cent of the weight of the ore. From 1.1 to 1.3 tons of coke is required to produce a ton of pig iron. If we assume

²⁰ In the Lorraine ore, Fe_2O_3 . Iron ores also occur as carbonates.

²¹ On a simple chemical basis this would be of course utterly impossible in any such apparatus as a blast furnace. Even an electric furnace uses four or five times as much carbon (charcoal or coke) as would be necessary to unite with the oxygen in the ore (usually Fe_2O_3 or Fe_3O_4). But steady progress has been made in reducing the coke consumption of the modern blast furnace.

a Lorraine ore free from siliceous material and containing enough limestone for the smelting process, the blast-furnace charge will consist of say 72 per cent ore and 28 per cent coke.

The molten metal that is drawn from the furnace is not pure iron. It contains, among other impurities, from 4 to 6 per cent of carbon, which makes it unfit for use except for castings; but the most important element present in the iron from the Lorraine minettes is the phosphorus, which is carried over from the smelting process. The great need in modern industry is for steel rather than for cast iron, and until about 1880 there was known no practical method of converting the Lorraine pig iron into steel without retaining the phosphorus. Such steel was so brittle as to be practically useless for general structural purposes.

Pig iron is converted into steel by burning out the greater part of the carbon and other impurities and adding such other metals to the molten mass as to secure the particular quality of steel desired. This is accomplished on a scale commensurate with the output of the modern blast furnace by passing air through the molten mass of metal in the Bessemer converter, or by means of the Siemens-Martin furnace, commonly called the open-hearth furnace, which permits a more accurate control of the finished product. The latter method is gradually replacing the Bessemer process, although it requires more fuel, owing to the fact that usually the pig iron, the scrap

iron and the other materials are remelted together, while in the Bessemer process the molten metal is transferred directly from the blast furnace to the converter.²²

A considerable saving is effected by utilizing the heat in the newly made steel. When the metal comes from the converter or open-hearth furnace, it is in a molten state. In the most efficient modern practice it is not allowed to cool, but is sent directly to the rolling mill in the form of white-hot ingots. These are rolled into blooms, billets, rails, beams, girders, bars, sheets, and the like, without the requirement of any fuel for reheating. A modern metallurgical plant, therefore, is likely to be equipped with blast furnaces, converters or furnaces, and rolling mills. Often, too, it has its own coke ovens. It is in a position to take in raw materials such as iron ore and coal at one end and turn out finished products at the other.²³

The production of good steel from Lorraine iron ore is dependent upon an efficient method of removing the phosphorus from the pig iron. Both systems referred to above in their original form produced steel which retained practically all of the phosphorus. A young English amateur chemist, a dreaming socialist-idealist clerk in the Marlborough

²² This direct transfer of molten pig iron is also often made to the Siemens-Martin furnace; but even so, considerably more heat is required in the process.

²³ Such a plant is said to be integrated. See discussion in next chapter.

Street police court in London, undertook to solve the problem of removing this phosphorus, and succeeded. He knew that phosphorus would unite with a basic material such as limestone, but of course limestone could not be added directly to the molten mass of metal in the steel making process. The linings of both the Bessemer converter and the Siemens-Martin furnace had hitherto been made of an acid material, a silicate. The young Englishman merely changed this and made the linings of a composition containing limestone, and the problem was solved.

He had enormously increased the quantity of workable iron ore in the world, and incidentally he had made available in the form of the phosphorus impregnated slag from the steel plants an extremely valuable fertilizer, thus reducing considerably the cost of production. All this happened about 1875, when the young Englishman was 24 years of age. He died 10 years later, leaving the considerable fortune which he had gained from his invention to an organization for ameliorating the lot of the workers in iron and steel. His name was Sidney Gilchrist Thomas.²⁴

The history of the great iron and steel industry of Continental Europe really began with the general

²⁴ A very interesting brief account of this invention is given in Engerand, F., *Le Fer sur une Frontière*, p. 147. See also, Laufemburger, *L'Industrie Sidérurgique de Lorraine et la France*. Also Burnie, *Memoirs and Letters of Sydney Gilchrist Thomas, Inventor*.

adoption of the Thomas process. Certain quantities of iron were produced in Lorraine before 1880, but the extent of the industry was as nothing compared with the great iron production of England, where a large part of the native ore contained no phosphorus. Small bodies of ore mixed with coal had been discovered in Westphalia and certain iron masters had started operations there; but the supply was soon exhausted and these pioneers were obliged to look around for additional ore. Certain small sections of the Lorraine deposits contained a small enough percentage of phosphorus to produce good steel. But after about 1850 the Bessemer converter and the Siemens and the Martin furnaces made steel making a large-scale affair, and the small plants were hard pressed to survive.

Both in the Ruhr and in Lorraine the metallurgical industry remained a small scale affair until after 1880. It is true that the Ruhr district had been receiving a certain amount of iron ore from Sweden, and the industry there was somewhat more advanced than in Lorraine; but the Swedish ores for the most part also contained phosphorus, so that steel making on a large scale had not been possible. With the general application of the Thomas process the great potentialities of the iron and steel industry in western Continental Europe became apparent. All that was required to create one of the greatest industrial centers of the world was the co-operative use of the Lorraine ores and the Ruhr coal. The indus-

trial expansion that followed was on a scale commensurate with the potentialities, although the steady progress towards a complete partnership between the Ruhr and Lorraine was arrested by the Great War.

III. INDUSTRIAL EXPANSION

The development of the Ruhr-Lorraine industrial system has resulted essentially from the free play of economic forces. This statement should be taken to mean simply that before the Great War political barriers did not seriously hamper the growth of the coal and iron industry in this section of western Europe. It should not be taken to mean, however, that the growth has always been peaceful and regular. The struggle for survival and dominance has often been severe, but it has been essentially economic and not political.

When the Lorraine ores came into their own as one of the most important mineral deposits in the world, the Lorraine region, and to a certain extent also the Saar district, began to compete with Westphalia in iron production. Owing to the fact that a much greater weight of ore than of coke is required in the smelting process, some of the leaders in the Lorraine branch of the industry were convinced that the logical location for the bulk of the blast-furnace equipment was in their territory, and a certain rivalry between the Ruhr and Lorraine has provided a subject of discussion and dispute for the Chambers

of Commerce and the politicians of the two regions. Until the return of Alsace-Lorraine to France at the end of 1918, whatever competition existed was chiefly between Germans, the iron masters on the French side of the frontier usually being able to obtain sufficient coke to produce as much pig iron as they could consume or sell.

Since the war much has been made of the bitter conflict which is alleged to have existed always between the Ruhr and Lorraine,²⁵ but in reality it would be difficult to prove that there has been anything more than the rivalry naturally to be expected between two competing districts. As we shall see further on,²⁶ the great metallurgical industries of Lorraine were for the most part closely related to those of the Ruhr, being in fact often owned by the same firms.²⁷

The Lorraine-Luxemburg region has rivaled the Ruhr in pig iron rather than steel production. From the beginning of the period of industrial expansion the blast furnaces in the vicinity of the iron mines have been more than able to hold their own in competition with the Ruhr and Rhineland. The annual output of the region (German and French Lorraine and Luxemburg) increased from 1,091,532 tons in 1880 to 2,777,696 in 1895 and to 9,904,111 tons in

²⁵ See Engerand, F., *Le Fer sur une Frontière*, Part II, Chaps. V & VI, and other French writers.

²⁶ See p. 58, Chap. III.

²⁷ One important exception is the great *Maison de Wendel*, whose iron and steel plants are all in Lorraine. See p. 59, Chap. III.

1913, as compared with an increase in the Ruhr and Rhineland of from 1,547,412 tons in 1880 to 2,793,950 tons in 1895 and to 8,167,793 tons in 1913.²⁸

In the production of steel, however, the Ruhr and Rhineland have forged ahead.²⁹ The output (in *halb fabrikate* and *fertig fabrikate* products) increased from 1,549,680 tons in 1880 to 2,792,210 in 1895 and to 9,503,293 tons in 1913, as compared with an increase (in the same products) in the Lorraine-Luxemburg region of from 201,778 tons in 1880 to 621,504 in 1895 and to 4,881,936 tons in 1913.³⁰

There are two principal economic reasons for the greater production of steel in the Ruhr and Rhineland, both based on the coal of the Ruhr. In the first place, the mere conversion of pig iron into steel usually requires a certain amount of additional fuel; and secondly—by far the more important reason—the efficient transformation of the steel into marketable form requires large resources of both heat and power, which are most economically available in or near a coal producing district. From the generation

²⁸ Compiled from: *Annuaire Economique et Politique 1881; Statistique de l'Industrie Minérale, 1895, p. 140 and 1913, p. 174; Statistik d. D. Reichs V. 48, Heft. X, p. 62; Viertelsjahrshefte zur Statistik d. D. Reichs, 1896, Heft. IV, pp. 29-38, and 1916, Heft. III, p. 19; Chambre de Commerce du Gr. Duché de Luxembourg—Rapport, 1915, p. 28.*

²⁹ See tables and discussion in Chap. III.

³⁰ Compiled from same sources as above. The production of steel ingots in the Lorraine-Luxemburg region in 1913 amounted to 5,761,232 tons, nearly a million tons being shipped away from the districts in this form, largely to the Ruhr and Rhineland and other German districts.

of electricity by means of coal too poor in quality for shipment, to the utilization of the gases from coke plants, a coal mining region is ideally suited for supplying low-priced heat and power.

The growth of the iron industry in Lorraine has been made possible by the supply of Ruhr coke. The production of ore in the Lorraine-Luxemburg basin increased from 4,827,418 tons in 1880 to 11,219,428 tons in 1895 and to 48,096,050 tons in 1913.³¹ Of these quantities 3,244,597 tons were consumed in the Lorraine-Luxemburg region in 1880, 7,904,493 tons in 1895 and 31,763,000 tons in 1913.³² The remainder was shipped mainly to Belgium, the Saar district, northern France, and in increasing quantities during the later years to the Ruhr and Rhineland.³³

For the coke necessary to smelt these enormous quantities of ore the principal source of supply has been the Ruhr. In 1913 the entire output of 48,000,000 tons, consumed mainly in Germany, France, Belgium and Luxemburg, required in round numbers 20,710,000 tons of coke. This was secured from the following sources:³⁴

³¹ Compiled from same sources as figures on p. 39 above.

³² Figures for 1880 and 1895 compiled from same sources as above. Those for 1913 from a computation of Brooks & Lacroix, Bulletin 703, U. S. Geological Survey, p. 32. Statistical Report No. 3, 1917, p. 33 of the Iron, Steel and Allied Trades Federation gives the figure of 31,057,000 tons.

³³ According to the computation of Brooks & Lacroix, the shipments in 1913 were as follows: To Belgium, 6,405,000 tons; to north and central France, 1,868,000 tons; the Saar, 3,273,000; to Westphalia and Rhineland, 4,439,000.

³⁴ Brooks and Lacroix, Bulletin 703, U. S. Geological Survey, p. 26.

		Percentage of Total
Ruhr and Rhineland...	14,311,000 tons	69
Saar & Lorraine ^a	3,086,000 tons	15
France	2,553,000 tons	12
Belgium	760,000 tons	4
Total	20,710,000 tons	100

^a According to *Viertelsjahrshefte zur Statistik d. D. Reich*, 1916, III, p. 15, the total coke production of these districts in 1913 was only 1,977,470 tons, although this does not include the production of the metallurgical plants themselves, for which figures are not available. Presumably Brooks & Lacroix have included this coke.

There exists a theoretical transportation ratio for the exchange of Lorraine ore against coke. On the basis of the most efficient utilization of the transport equipment, that ratio is five tons of ore in exchange for four tons of coke. It derives from the fact that iron ore has a higher specific gravity than coke, so that a railway car, for example, designed to contain when fully loaded 16 tons of coke will easily contain 20 tons of ore. As a matter of fact, its volume is great enough to contain a considerably larger tonnage of ore, but the carrying capacity imposes a limit upon the load. Consequently, the five-four ratio has been adopted as the best compromise for efficient transportation, and a considerable part of the railway equipment operating between the Lorraine region and the Ruhr before the war was specially designed and built for the purpose of carrying iron ore and coke in those proportions.

Now it happens that four tons of coke is sufficient to smelt about ten tons of Lorraine ore (producing about three tons of pig iron). Five tons of ore

shipped out should bring back (purely on the efficient transportation ratio) enough coke to smelt 10 tons of ore. Theoretically, therefore, the Lorraine region should convert two-thirds of its ore production into pig iron and one-third should be sent away in exchange for coke. Taking the ore producing region as a whole (German and French Lorraine and Luxemburg), this is approximately what happened in 1913. Of the 48,000,000 tons produced in that year, 31,119,000 tons, or 65 per cent of the total, were consumed on the ground, and the remainder, amounting to 16,881,000 tons, was shipped to Belgium, to Westphalia and the Rhineland, to the Saar district, and to northern and central France—all coal producing districts. The Lorraine region received in return from all those districts combined 11,075,000 tons of coke, or approximately 3.3 tons of coke for every five tons of iron ore shipped out.³⁵ However, one large metallurgical concern in German Lorraine (the De Wendel Company) ³⁶ also received considerable quantities of coking coal from the Ruhr which was made into coke on the ground, so that on the whole the exchange of iron ore for coke may be considered to have been about five to four.

But the Lorraine region before the war received from the Ruhr much more coke than the quantity of

³⁵ Figures compiled from Brooks & Lacroix, Bulletin 703, U. S. Geological Survey, and from German Imperial Traffic Statistics—see note to table on p. 71, Chap. III, this book. According to Brooks & Lacroix, the total consumption of coke in the Lorraine region in 1913 amounted to 12,260,000 tons.

³⁶ See discussion in Chap. III.

iron ore furnished in return. The figures given above correspond with the theoretical ratio only when considered *en bloc*, and are, therefore, something in the nature of a coincidence, notwithstanding their logical implications. As between the Lorraine region and each separate coal producing district the exchange ratios were widely different. The following table shows the shipments in detail for the year 1913: ³⁷

THOUSANDS OF METRIC TONS

	Lorraine Ore Con- sumed	Percent- age of Total Ore Shipped Out	Coke Supplied to Lor- raine Region	Percent- age of Total Coke Supply
French Lorraine.....	10,408	....	....	....
Lorraine Désannexée.....	12,214	....	....	....
Luxemburg	8,497	....	....	....
Total Lorraine Region....	31,119	....	....	....
Ruhr and Rhineland.....	4,778	28.3	8,401	76.0
Saar District.....	4,471	26.4	398	3.6
Belgium	6,404	38.0	676	6.1
Northern & Central France.	1,228	7.3	1,600	14.3
Total Exchanges.....	16,881	100	11,075	100

It will be observed that whereas the Ruhr and Rhineland received only 28.3 per cent of the ore shipped away from the Lorraine region, that region received from the Ruhr and Rhineland 76 per cent of its total coke imports. The chief reason for this lies in the fact that the German firms operating both in the Ruhr and in Lorraine considered it more ad-

³⁷ See note 35 above.

vantageous to send coke to Lorraine and smelt the bulk of the low-grade ores on the ground and to ship to the Ruhr pig iron or raw steel. In practice, of course, both iron ore and crude metal were shipped, according to the requirements of the great firms operating in both regions.

The Saar coal field has played a limited rôle in the iron and steel industry. Its great disadvantage has been that its coal does not produce good coke. Otherwise, however, it has constituted a veritable treasure trove for the Prussian state.³⁸ The natural market for this coal was southwestern Germany—the Palatinate and Alsace-Lorraine—and north-eastern France. It had to compete only with coal from the Ruhr, the price of which was increased by the transport charges, and with coal from the French mines, the supply of which was inadequate even for the domestic market.

It has been argued that Imperial Germany has systematically prevented the concentration of the metallurgical industry near her southwest frontier for reasons of military strategy.³⁹ As proof of this contention it has been maintained that the Prussian

³⁸ Wages were also lower in the Saar district than in the Ruhr. For an account of the long controversy that has existed over this question, see *Correspondenzblatt d. Generalkommission der Gewerkschaften Deutschlands*, No. 50, Dec. 14, 1912, p. 756, for the miners' contentions. For the mine owners (the Prussian State) see *Wirtschaftsrechnungen Saarbrücker Bergleute*, Berlin, 1913, Vol. 4.

³⁹ See Engerand, *Le Fer sur une Frontière*, Part II, Chap. V; also Laufenburger, *L'Industrie Sidérurgique*, pp. 53, 104 and several other references to Germany's policy.

government has deliberately created the idea that Saar coal was unfit for coking purposes. It has been asserted that private firms in the Saar district have bought coal from the state mines and made acceptable metallurgical coke of it, while the coke made from the same coal by the state coking plants was unfit for use.⁴⁰

The experience since the war of the French Government in operating the Saar mines, however, has hardly been such as to bear out the assertion. In spite of the manifest need of coke for the newly acquired blast furnaces in Lorraine, the proportion of the coal output transformed into coke has been much less than in 1913. The figures are as follows:⁴¹

	Coal Output	Coke Production	Ratio of Coke to Coal Output
1913.....	13,217,000	1,777,000	13.4 per cent
1919.....	8,981,000	812,000	9.0 " "
1920.....	9,410,000	240,000	2.6 " "
1921.....	9,574,000	177,000	1.8 " "
1922.....	11,243,000	254,000	2.3 " "
1923.....	9,192,000	133,000	1.4 " "

The early years of the present century were marked by an extraordinary expansion in the German metallurgical industry. A general reorganiza-

⁴⁰ Engerand, p. 187; also Laufenburger, p. 53.

⁴¹ *Jahresbericht der Aktiengesellschaft Reichskohlenverband*, 1923-24, p. 6. It should be noted that these figures do not include the coke produced by the metallurgical plants themselves. According to *L'Industrie Sidérurgique en Lorraine, 1921-22, Année VIII*, this amounted to 638,863 tons in 1919.

tion in the system of production and distribution had been going on for a number of years. The *Kohlensyndikat* had been formed in 1893; and the coal and iron industries of the Ruhr district were perfecting a form of productive organization known as "vertical combinations,"⁴² wherein the same concern possessed its own supply of fuel as well as of iron ore. Various cartels, or "horizontal combinations," for the marketing of the iron and steel products, were functioning by 1900. In 1904 the *Stahlverband*⁴³ was organized to control the production and distribution of about 90 per cent of the whole steel output of Germany. The industries of the Ruhr and Rhineland and those of German Lorraine and Luxemburg entered the organization on approximately equal terms.

Due largely to the activity of this powerful syndicate in promoting the consumption of iron and steel products in Germany and in finding markets abroad, the production increased by leaps and bounds. The output of steel in Germany and Luxemburg which was 8,522,000 tons in 1904, increased to 11,415,000 tons in 1909 and to 18,330,000 tons in 1913.⁴⁴

A preponderant part in the German iron industry has been played by the Lorraine ores. After the organization of the *Stahlverband* the matter of an

⁴² See discussion on p. 56, Chapter III.

⁴³ See Article by Francis Walker, *Quarterly Journal of Economics*, May, 1906; also discussion on p. 63, Chapter III.

⁴⁴ *Vierteljahrshefte zur Statistik d. D. Reichs*, 1905, IV, p. 156; 1910, IV, p. 48; 1916, III, p. 23.

adequate supply of ore became ever more important. The production of German Lorraine and Luxemburg was greatly increased, but, even so, the metallurgical industry found it necessary to import large quantities from abroad, and even to secure additional Lorraine ore from the French side of the frontier. The accompanying table (p. 48) will show the principal sources of supply of the German Customs Union at two-year intervals from 1900 to 1913. It will be noted that the total imports at the end of the period were nearly three and a half times greater than at the beginning.

Since practically all of the imports from France came from French Lorraine, it will be observed that the Lorraine ores entered into Germany's total consumption to a very large extent. Throughout the period from the beginning of the century to the outbreak of the war these ores made up nearly 70 per cent of the total.⁴⁵

The efficient functioning of the Ruhr-Lorraine system has depended very largely on transportation. Transportation costs constitute a far more important factor in the coal and iron industries than in most others. The weight and bulk involved are such as to render this self-evident. While the distance separating the Ruhr and Lorraine regions is not great, it is nevertheless sufficient to play an important rôle in the cost of production of iron and steel.

⁴⁵ Due to the low metallic content of the minettes of Lorraine, these ores only accounted for about half of the pig iron output.

SOURCES OF IRON ORE CONSUMED IN GERMAN CUSTOMS UNION *

Thousands of Metric Tons

	1900	1902	1904	1906	1908	1910	1912	1913
Production								
German Lorraine.....	7,742	8,793	11,135	13,835	13,283	16,636	20,050	21,136
Luxemburg	6,171	5,130	6,348	7,229	5,801	6,263	6,534	7,331
Other Districts.....	5,051	4,041	4,564	5,671	5,194	5,811	7,127	7,474
Total Production..	18,964	17,964	22,047	26,735	24,278	28,710	33,711	35,941
Imports								
France (principally French Lorraine)...	66	54	260	480	920	1,774	2,692	3,811
Sweden	1,438	1,144	1,584	2,361	3,138	3,249	3,875	4,564
Spain	1,849	1,918	3,003	3,632	1,979	2,861	3,726	3,632
Other Imports.....	754	841	1,214	1,157	1,696	1,932	1,827	2,017
Total Imports.....	4,107	3,957	6,061	7,630	7,733	9,816	12,120	14,024
Production plus Imports	23,071	21,921	28,108	34,365	32,011	38,526	45,831	49,965
Exports	3,248	2,868	3,441	3,852	3,068	2,953	2,310	2,613
Available for Consump- tion	19,823	19,053	24,667	30,513	28,943	35,573	43,521	47,352

* *Vierteljahrshefte zur Statistik d. D. Reichs*, 1903 IV, p. 105; 1905 IV, p. 131; 1907 IV, p. 270; 1909 IV, p. 86-9; 1911 IV, p. 20-3; 1913 III, p. 158; 1914 I, p. 370; III, p. 120; *Statistisches Handbuch für das D. Reich*, II, p. 112; *Statistisches Jahrbuch für d. D. Reich* 1908, p. 130; 1910, p. 171; 1912, p. 201; 1915, p. 201.

The bulk of the traffic between the Ruhr and Lorraine has been by rail. Specially designed railway cars have been built to carry coke to the Lorraine region and return to the Ruhr loaded with iron ore. In the matter of sheer tonnage, the traffic between the two regions before the war was greater than between any other two sections of Europe.

While the Moselle River and its tributary, the Saar, are generally considered navigable streams, they have in fact been little used for water transportation. The Moselle pursues a tortuous course to the Rhine and is for the most part wide and shallow, making navigation difficult or impossible for heavily laden boats. The Rhine itself, while it is one of the greatest inland waterways in the world and is extensively used for the shipment of coal from the Ruhr to South Germany, is so far away from the iron fields that it has been very little used for transportation between the Ruhr and Lorraine.

It is true that if the Moselle were dredged or canalized, it would provide, in conjunction with the Rhine, a direct water route between the great coal and iron fields. A controversy has long existed between the Chamber of Commerce of Duisburg-Ruhrort (in the Ruhr district) and that of Saarbrücken over this question. Curiously enough, there was a complete reversal of attitude of these two organizations after the formation of the *Stahlverband* in 1904. Before that date there was no more vigorous advocate of canalizing the Saar and the

Moselle than the Chamber of Commerce of Duisburg-Ruhrort, while the Saarbrücken Chamber was its bitterest opponent. After 1904 the latter organization joined with the Lorraine iron producers in clamoring for the canalization of the two rivers, while the Duisburg-Ruhrort Chamber and the Westphalian group became the bitterest opponents of the project.⁴⁶ No logical reason has been advanced by either side for the change of front. It is probable that both were animated by the desire to profit by some real or imaginary change brought about by the organization of the *Stahlverband*.

Since the Prussian state owned the railway system connecting the Lorraine region with Westphalia, and the freight rates have usually been higher on coal and coke shipments from the Ruhr to Lorraine than on iron ore shipments back to the Ruhr, it has been argued that Germany has systematically favored the Westphalian iron industry as a part of a far-reaching plan of military strategy.⁴⁷ The Prussian government, it is asserted, has always refused to canalize the Moselle and the Saar rivers, for fear that with the increased transport facilities thus made available the Ruhr iron and steel industry would emigrate to Lorraine.⁴⁸ Whatever the merits of this argument the fact remains that the question of canalizing the two rivers was still unsettled at the

⁴⁶ Schumacher, Hermann, *Die West Deutsche Eisen Industrie und die Mosel Kanalisierung*, Leipzig, 1910.

⁴⁷ F. Engerand, *Le Fer sur une Frontière*, p. 199.

⁴⁸ *Ibid.*

outbreak of the war. It now becomes an international problem to be worked out by France and Germany in connection with the larger problem of the economic relations between the Ruhr and Lorraine.

In the disputes that have existed between Westphalia and the Lorraine region, the arguments advanced by both sides have the peculiar quality of working both ways. Each is a two-edged sword. Low freight rates would have benefited both sides.⁴⁹ The Prussian state could not discourage the use of Saar coal for coke making without the loss of potential revenue from the Saar mines. It would be difficult, therefore, to demonstrate that either the Prussian state or the Imperial German Government actually favored either section at the expense of the other.⁵⁰ In spite of the disputes over transportation costs and the controversy over the improvement of the water routes of the Moselle and Saar rivers, it is safe to repeat the assertion made at the beginning of this discussion: that the development of the west-European coal and iron industry has resulted essentially from the unhampered action of economic forces.

⁴⁹ The more so, since with the exception of the *Maison de Wendel*, all the largest plants in Lorraine were owned by firms operating also in the Ruhr.—See discussion on p. 58, Chap. III.

⁵⁰ To say nothing of the legendary power of the Imperial Government to do what it wished and the fact that a very large proportion of Germany's metallurgical industry actually did develop in Lorraine.

CHAPTER III

THE RUHR-LORRAINE SYSTEM—THE ECONOMIC ORGANIZATION

Having briefly reviewed the material bases of the Ruhr-Lorraine industrial system and the enormous expansion of the iron and steel industry in western Europe during the thirty-odd years preceding the World War, it will now be of advantage to examine certain elements of the economic organization which were largely responsible for the important place occupied by that system in the economic structure of Europe and of the world.

In many respects the iron and steel industry of western Europe presents one of the most striking examples of industrial and business development that has been witnessed in the modern world. It offers a rich field for the student of practical economic methods, and it has been the subject, both before and since the war, of many books and special articles.¹ In the present chapter an endeavor will be made, not to discuss at length and in detail the complex organization which existed in western Germany, France and Belgium at the outbreak of

¹ A number of these are listed in the bibliography at the end of this book.

hostilities in 1914, but to set forth in brief outline the salient facts relevant to the Ruhr-Lorraine industrial system, with special reference to the production and distribution of coal, iron and steel.

I. INDUSTRIAL COMBINATIONS

Perhaps more than any other country in the world, modern Germany has been the scene of large industrial combinations.² These have been for the most part of two general classes, namely: (1) "vertical" combinations,³ wherein the same concern possesses its own supply of raw materials, its own factories for carrying those materials through the various stages of manufacture and turning out finished products, and in many cases its own marketing organization; and (2) "horizontal" combinations, formed primarily for the purpose of regulating the production and sale of a single commodity or of a clearly defined class of commodities.

Vertical, or integrated, combinations are essentially organizations for production, while the horizontal type, or *kartelle*, of which there are several varieties, are designed chiefly to control distribution. In some respects the horizontal combinations have represented a tendency in the opposite direction to

²Stockder, A. H., *German Trade Associations*. Stockder declares that the development of such combinations in Germany "is remarkable; but perhaps no more so than the rise of the great industrial holding companies of the United States with which it is contemporaneous." See p. xix.

³The commoner term is *integration*, which is perhaps more descriptive.

that of the vertical type; that is, they have tended to cause concentration in the production of single commodities, whereas the vertical combinations have tended towards diversification. Both classes have played important parts in the development of the Ruhr-Lorraine industrial system, and both have existed in intimate relations one with the other in the iron and steel industry.

The German iron masters came relatively late into the field of large-scale production. Both in Great Britain and in the United States the existence of considerable quantities of non-phosphoric ores led to the adoption of the Bessemer and the Siemens-Martin processes about 1850 and to a rapid expansion of the industry. In Germany, on the other hand, before the introduction of the Thomas process, the metallurgical industry had been comparatively backward. This tardy start brought a certain advantage to the Westphalian and Lorraine iron masters, in that it permitted them to profit by all that had been learned of industrial organization to date and to install the most modern equipment without having to scrap existing plants. They were confronted, however, with the necessity of borrowing large sums for capital investment, and this in turn made it necessary to develop very rapidly a highly efficient organization for the production and marketing of goods.

A policy was adopted of producing large quantities of goods, and of selling abroad at a small margin of

profit the surplus that could not be disposed of in Germany. The home market was protected by high tariffs, and exports were encouraged not only by the great syndicates but also by the government. The railway system was operated as an adjunct of industry and as a stimulus to export trade rather than as a mere revenue producing agency. Exports were further facilitated by the intimate relations existing between the iron masters and the great German banking institutions. Banks granted loans to the manufacturers on goods sold abroad on long term credits, thus permitting them, when necessary, to pay cash for their imports of raw materials. Under such a scheme of financing the trend of development in the German iron and steel industry was naturally towards large combinations and a highly efficient organization for the production and distribution of all manner of iron and steel goods.

Vertical combinations have predominated in the German iron and steel industry. In addition to the financial advantage inherent in large combinations, two principal reasons have been adduced to account for the tendency to integration: first, the desire of the iron masters to render themselves independent with respect to their supply of raw materials; and second, the technical efficiency obtainable in a highly integrated enterprise—in particular, the saving of fuel accomplished by carrying out many of the processes of transformation before the metal has lost its original heat of the blast-furnace or converter stage.

The first reason is responsible for integration "downward," and the second for integration "upward."

Originally most of the metallurgical plants in the Ruhr depended on other concerns for their fuel supply; and the coal mine owners to a considerable extent held the iron masters at their mercy. As early as 1882 a Coke Association⁴ was formed at Dortmund for the purpose of controlling the production and sale of that commodity. Prices were periodically fixed with a distinct tendency to rise. This state of affairs led the iron masters to acquire coal lands and to open mines of their own.

In 1893 the independent mine owners organized the *Rheinisch-Westphalisches Kohlensyndikat*, along somewhat the same lines as the Coke Association.⁵ At first the metallurgical concerns owning coal mines, accounting for approximately 10 per cent of the output of the Ruhr district, refused to adhere to the *Syndikat*, and for 10 years there was bitter economic strife between the two groups.⁶ When the *Kohlensyndikat* was reorganized and amalgamated with the Coke Association in 1903, however, the metallurgical firms joined the combination, and they soon began to wield an influence in its affairs out of all proportion to their share of the total coal pro-

⁴ See Stockder, *German Trade Associations*, p. 51. This was a double *kartell*—a group of producers who agreed to limit their production to the estimated market demand, and a sales organization.

⁵ *Ibid.*, p. 57. It should be observed that these were "horizontal" combinations.

⁶ *Ibid.*, p. 84.

duction.⁷ In the meantime, the iron masters had gone on buying mines and increasing their coal and coke output. Thus the metallurgical industry was securing its own fuel supply and rendering itself independent of the coal and coke market.

Simultaneously with the acquisition of coal mines in Westphalia, the iron masters were purchasing iron mines in Lorraine and Luxemburg, thus completing their control over their basic raw materials. In many cases, however, they found it advantageous to install blast furnaces in the vicinity of the iron mines and to ship pig iron or raw steel to their finishing plants in Westphalia rather than to bring the low-grade iron ore from Lorraine. In this manner there came into being a special system of vertical combinations, known as *intégration à distance*,⁸ where the elementary processes of transformation were carried out at the source of the iron ore, and the metal in its cruder forms (pig iron and steel ingots) was shipped to the coal producing district for finishing. By 1913 every iron producing concern of importance in Germany was thus integrated through ownership of raw materials, and a large proportion were also equipped to turn out finished products.

⁷ *Ibid.*, p. 86. In 1903 there were eight of these firms: (1) Georgs-Marien—Bergwerks und Hüttenverein, (2) Hoerder Bergwerks und Hüttenverein, (3) Union A. G. für Bergbau, Eisen u. Stahlindustries, (4) Bochumerverein für Bergbau u. Gusstahlfabrikation, (5) Friedrich Krupp, (6) Gutehoffnungshütte, (7) Deutscher Kaiser, (8) Mansfeldische Kupferschieferbauende Gewerkschaft.

⁸ This term is taken from Laufenburger, *L'Industrie Sidérurgique*, . . . p. 106.

Many of the important iron works of the Lorraine region were integrated with those of the Ruhr. This was particularly true in the case of German Lorraine and Luxemburg, but at least one⁹ iron and steel plant as well as a considerable number of the iron mines in French Lorraine were also owned or controlled by German firms operating in the Ruhr district. In Appendix C¹⁰ will be found a table showing the principal firms operating in German Lorraine and Luxemburg, their ownership of concessions for iron mining, and their production in 1913 of iron and steel. It will suffice here to call attention to the fact that of the twelve blast-furnace plants producing pig iron in 1913 in German Lorraine seven were completely owned and controlled by German firms operating also in the Ruhr, and two by German firms operating in the Saar district. These nine plants in 1913 produced 2,812,000 tons of the total pig iron output of 3,870,000 tons.¹¹ The three others were of mixed ownership and control, being partly French, Belgian and Luxemburgian, as well as German.

Of the total 35,859 hectares of iron mining concessions in German Lorraine 23,532 hectares were owned by German firms of the Ruhr and Rhineland, while the remainder were of mixed ownership.¹² In Luxemburg, 2,830 hectares out of the total of 3,575

⁹ Société d'Aubrives—Villerupt—owned mostly by Gelsenkirchner Bergwerks A. G.

¹⁰ See p. 302.

¹¹ Brooks and Lacroix, Bulletin No. 703, U. S. Geological Survey.

¹² *Ibid.*

hectares of concessions were owned by purely German firms, and in 1913 these also accounted for 1,608,000 tons of the total pig iron output of 2,548,000 tons.¹³

In addition to their holdings in German Lorraine and Luxemburg, German firms of the Ruhr and Rhineland before the war also owned either entirely or in part 7,878 out of the total of 67,606 hectares of concessions of mineral lands in French Lorraine.¹⁴

On the other hand, certain French firms, notably the De Wendel Company, owned important mining properties in the Ruhr. This concern, in both French and German Lorraine, furnishes an excellent example of *intégration sur place*. Owning coal mines in the Ruhr as well as in the Saar district and in Lorraine and extensive iron mines in the latter region, the De Wendel Company has developed a complete iron and steel industry in the vicinity of the iron ore deposits. Coking plants, blast furnaces, steel plants, rolling mills, tinsplate mills, and numerous other installations for turning out finished iron and steel products are owned and operated in the Lorraine region.¹⁵ In 1913 the quantities of iron and steel produced by the De Wendel Company were as follows:

¹³ *Ibid.*

¹⁴ *Ibid.*

¹⁵ The present tense is here used because the De Wendel Company still exists as a French concern, practically the same as before the war.

	In German Lorraine ^a	In French Lor- raine ^b	Total
Pig Iron.....	847,000 tons	393,700	1,240,700
Steel Ingots	661,000 "	330,200	991,200
Finished Iron and Steel Products.	no data	208,200	.....

^a *Revue d'Alsace et Lorraine, Novembre, 1919, d'après le Capitaine Witzig, Office de Statistique d'Alsace et de Lorraine, numero special, 1921, p. 94.*

^b *Annuaire, Comité des Forges de France, 1918-1919, p. 569.*

A few other large concerns in German Lorraine were fully equipped to turn out heavy finished products, notably the thoroughly modern plant built just before the war by the Tyssen Company at Hagondange.¹⁶ They were therefore illustrations in part of *intégration sur place*. Practically all of the principal concerns, however, including the Tyssen firm, owned coal mines, coking plants and iron and steel works in the Ruhr district, where the more elaborate finishing processes were carried out. The De Wendel Company was the only important firm possessing its own coke ovens in the vicinity of the blast furnaces in Lorraine, these being supplied with coal from mines in the Ruhr.

*The Saar territory*¹⁷ was also an integral part of the Ruhr-Lorraine system. Of the seven firms owning iron and steel plants in this district before the war, at least six were also operating in the Lorraine region and owned extensive concessions for iron

¹⁶ Laufenburger, H., *L'Industrie Sidérurgique*, . . . p. 159.

¹⁷ Including the Bavarian Palatinate.

mining.¹⁸ Three owned coal mines and iron and steel works in the Ruhr and Rhineland.

Due to its plentiful fuel supply (over and above the coke for the blast furnaces) the Saar district has been an important producer of steel and of finished iron and steel products. The output of the territory in 1913 was 1,371,389 tons of pig iron, 2,302,010 tons of steel ingots, 1,529,740 tons of finished and 334,840 tons of half-finished iron and steel products.¹⁹ Nearly 600,000 tons of pig iron was imported into the district from Lorraine and Luxemburg for use in the steel plants.²⁰ The Saar territory, therefore, more than German Lorraine and Luxemburg, was the scene of *intégration sur place*.

It will be apparent from the foregoing data that the iron and steel industries of the Ruhr and Lorraine regions were closely knit together by common ownership of both their raw materials and plant. With the exception of the De Wendel Company and the plants in the Saar, the most important of the firms common to the two regions might be classified under the head of *intégration à distance*. The general method of procedure was to send coke or coking coal from the Ruhr to the Lorraine region and ship back to the Ruhr and Rhineland, in addition to a considerable tonnage of iron ore, large quantities of

¹⁸ Brooks & Lacroix, Bulletin No. 703, U. S. Geological Survey, pp. 57-79.

¹⁹ *Vierteljahrshefte z. Statistik d. D. Reich* 1916 III, pp. 19-23.

²⁰ See table on p. 70, this chapter.

pig iron, steel ingots and half-finished steel for transformation into finished products.

Thus the output of pig iron in German Lorraine and Luxemburg in 1913 was 6,417,000 tons, while the output of finished products amounted to only 1,869,964 tons.²¹ The greater part of the difference between the two figures represented shipments to the Ruhr and Rhineland, and the Saar district, either in the form of pig iron, steel ingots, or half-finished products.

Horizontal combinations have been prominent in the field of distribution. The iron and steel industry in Germany has been one of the leaders in the *kartell* movement which began its rapid development in the eighteen-eighties. By 1905 there were in existence 62 *kartelle* engaged in the sale of various iron and steel products.²² Three of these organizations, however, have been of particular importance in the growth of the metallurgical industry: the pig iron syndicate, the half-products syndicate, and the *Stahlverband*.

As early as 1886 a pig iron cartel was organized in the Ruhr district, and in 1892 this combination was extended to include the pig iron producers of the Lorraine region.²³ It became a syndicate and con-

²¹ *Viertelsjahrshefte z. Statistik d. D. Reich*, 1916 III, pp. 23-9.

²² Stockder, *German Trade Associations*, p. xix.

²³ Walker, Francis, *Quarterly Journal of Economics*, May, 1906, p. 362. It should be noted that a *kartell* is usually designated as a *syndikat* when, in addition to an agreement for the limitation of production, its organization provides for the sale by a marketing division of the entire output of its members.

trolled the production and sale of nearly the whole of the pig iron destined for the open market; but the tendency of the metallurgical industry toward vertical combinations resulted in the use of an ever increasing percentage of the pig iron output for the manufacture of steel by the same firms which produced it.

Among the numerous *kartelle* engaged in the marketing of iron and steel products, however, there was as yet no comprehensive organization covering the whole of the heavy steel industry. In 1899 there was perfected the half-products syndicate, under the leadership of Adolf Kirdorf, for regulating the production and sale of such products as ingots, billets, sheets, bars, etc. The organization was successful and undoubtedly did much to encourage the formation of a still more comprehensive combination. Numerous circumstances and conditions at the beginning of the present century, notably the great crisis in the German steel industry in 1901 and 1902, combined to demonstrate the necessity of some more comprehensive organization; and on March 1, 1904, under the leadership of Adolf Kirdorf, president of the half-products syndicate, there was formed the *Deutscher Stahlwerksverband*.

With the exception of the United States Steel Corporation (to the organization of which it bears only a slight resemblance), the German Steel Syndicate, popularly known as the *Stahlverband*, is the largest steel combination in the world. Like the *Kohlen-*

syndikat, it is a double combination, consisting of steel producers on the one hand and of a sales organization on the other. Its chief purposes have been officially defined as "(1) the maintenance of the domestic market, (2) the full occupation of the works, (3) the simplification of working programs of the works, and (4) the elimination of competition among German works in foreign markets."²⁴

At the beginning (1904), about 90 per cent of all the steel works in Germany were syndicated, and by 1913 practically every firm of any importance in the country, including those in Lorraine and Luxemburg, was a member of the *Stahlverband*. Some were forced to join the organization by rather vigorous economic pressure, notably the great *Phoenix*²⁵ concern. But once members of the combine, the refractory firms co-operated wholeheartedly in working for its success.

The *Stahlverband* was organized as an ordinary company of limited liability, but with a nominal capitalization.²⁶ All matters relating to the limitation of output, the dissolution of agreements, the fixing of prices, the conclusion of agreements with competitors, the classification of products, and numerous others are dealt with either by the General Assembly or by subsidiary bodies elected by that

²⁴ *Ibid.*, p. 373, taken from Enquete, S., V., p. 37.

²⁵ *Ibid.*, p. 366.

²⁶ The original share capital was 400,000 marks in registered shares not transferable without the consent of the General Assembly.

organization. The commodities covered by the original agreement are roughly divided into A-products, consisting of (1) crude steel and half-finished products, (2) railway material and (3) structural steel; and B-products, consisting of more highly finished and lighter products, such as bars, rods, sheets, wheels and tires, cast steel pieces, and the like.

Only the A-products were syndicated, although the B-products were originally cartellized to the extent of an agreement to limit their production. In the case of the A-products each member firm was allotted a certain quota of the total production beyond which it could not go without incurring a heavy penalty. The entire output was sold to the marketing division of the *Stahlverband* at uniform prices previously agreed upon. As far as possible, these products were then sold at home, where the market was protected by high tariffs, and the surplus was exported through the extensive foreign organization of the syndicate.²⁷

The one great weakness of the Stahlverband has been its failure to syndicate the B-products. From time to time cartels were formed for various specific commodities, but none was really successful from the standpoint of the larger organization. Two reasons are assigned by Tosdal²⁸ for this failure: (1) the

²⁷ For a discussion of the export policy, export bounties, international agreements with other steel producing countries and the like, see pp. 76-78, this chapter.

²⁸ Tosdal, H. R., *Quarterly Journal of Economics*, February, 1917, Vol. 31, p. 259.

tendency on the part of the steel industry as a whole to integration, and (2) the opposition of the straight rolling mills. The members of the *Stahlverband* were constantly demanding that their quotas of A-products be increased. But an increase for one firm necessarily entailed a decrease for others, and the matter was usually compromised by the granting of increases in the quotas of the non-syndicated B-products. This resulted in the production of larger quantities of the latter and added to the tendency towards integration.

On the other hand the straight rolling mills were not integrated concerns. They were, in fact, largely dependent on the *Stahlverband* for their supply of raw materials—raw steel and half-products—and their output consisted primarily of B-products. Consequently, they have always been the bitterest enemies of the steel syndicate, which (according to their claims)²⁹ not only maintained exorbitant monopoly prices for their raw materials, but competed with them in the B-products market. Although the output of the straight rolling mills was small in comparison with the total production of the members of the *Stahlverband*, it was nevertheless of sufficient importance to prevent the complete syndication of B-products.

From its original formation in 1904 until the out-

²⁹ Tosdal and Walker both conclude from a study of the German Steel syndicate that prices have not been exorbitant—that they have been primarily stabilized. Walker therefore pronounces the *Stahlverband* a “good” trust.

break of the war the *Stahlverband* was twice re-organized, once in 1907 for a five-year period and again in 1912, along much the same lines as the original combination. In 1912, however, the syndicate relinquished all control over B-products and confined its activities exclusively to A-products. The existence of the organization was extended in 1917 for another five-year period, and again in 1922. There has been, however, in the later years much difference of opinion as to its future, some doubt being manifested as to its continued existence.

There can be little doubt that the *Stahlverband* has fallen short of the great expectations of some of its earlier proponents. The output of A-products (exclusively sold by the syndicate) only increased from 4,995,000 tons in 1904-05 to 6,395,000 tons in 1912-13, whereas the output of steel in Germany (A- and B-products combined) increased in the same period from 8,900,000 tons to 18,900,000 tons.³⁰ Tosdal seems inclined to believe that because of the tendency to integration in the steel industry a cartel such as the *Stahlverband* represents only a phase of development. On the other hand it might be argued that the syndicate may change its form and become adapted to the still more general tendency towards large business combinations.

Syndicates have usually been called into being by difficulties in finding markets for the output of any

³⁰ Tosdal, *Quarterly Journal of Economics*, February, 1917, p. 292.

particular commodity.³¹ It is quite possible that the failure of the *Stahlverband* before the war to syndicate B-products is due primarily to the fact that during the greater part of its existence markets for such products were fairly easy to find. Although it is of course impossible to foresee the development of the steel industry in this respect there seems to be good reason to believe that some kind of horizontal combination is likely to be prominent for many years to come.

II. THE PRE-WAR MARKETS

In order to complete this brief survey of the essential elements in the production and distribution of coal, iron, and steel in western Europe, it will be necessary to say something of the ultimate destination of the various commodities produced. With this end in view it will be convenient to consider, first, the consuming capacity of the territory contiguous to the Ruhr-Lorraine region, and secondly, the position held by the Ruhr-Lorraine system before the war in the iron and steel markets of the world.

Germany was at once the greatest producer and the largest consumer of coal, iron, and steel in western Europe. The accompanying tables (pp. 69-71) have been devised to show the interchange in 1913 of four principal commodities—coal, coke, iron ore, and pig iron—among the different geographical sub-

³¹ For example, the *Kohlensyndikat*, and the *Stahlverband* itself.

RELATIVE IMPORTANCE OF CERTAIN EUROPEAN COUNTRIES •
AS PRODUCERS AND CONSUMERS OF COAL AND IRON IN 1913

COAL and COKE (a)

Quantity Figures in Thousands of Metric Tons

WORLD CONSUMPTION		SOURCE OF SUPPLY—BY PRODUCING COUNTRIES									
BY COUNTRIES	TOTAL QUANTITIES	PERCENT- AGE OF WORLD CONSUMP- TION	German Customs Union					TOTAL GERMAN CUSTOMS UNION	FRANCE	BELGIUM	ALL OTHERS
			Ruhr (b) and Rhineland	Saar- Palat- inate	Lorraine Désan- nerée	Luxem- burg	Rest of Ger- many				
GERMAN CUSTOMS UNION	Coal	5.0	60,182	444	30	—	—	60,656	—	89	392
	Coke	9.9	10,750	—	—	—	—	10,750	—	—	—
	Coal	0.7	7,352	6,495	579	—	—	7,946	—	6	—
	Coke	1.6	1,723	1,574	—	—	—	1,723	—	—	—
Lorraine Désannérée	Coal	0.2	2,276	694	1,461	—	—	2,268	8	—	—
	Coke	3.9	4,175	180	200	—	—	3,886	7	—	—
Luxembourg	Coal	—	541	72	178	—	71	437	—	103	1
	Coke	2.6	2,833	—	—	—	—	2,686	—	145	2
Rest of Germany	Coal	7.6	92,569	3,265	1,051	—	40,970	82,601	—	171	9,797
	Coke	8.6	9,310	—	—	—	4,980	9,152	—	—	158
TOTAL.....COAL	163,775	13.5	97,888	10,970	3,809	—	41,041	153,208	8	369	10,190
GERMAN CUSTOMS UNION...COKE	28,791	26.6	21,253	1,754	200	—	4,980	28,197	7	427	160
FRANCE.....COAL	58,376	5.0	2,211	932	424	—	—	3,567	38,579	4,661	11,569
	COKE	5.3	5,779	18	—	—	—	2,377	2,709	511	182
BELGIUM.....COAL	26,541	2.2	6,056	101	—	—	—	6,167	811	17,218	2,345
	COKE	3.3	3,537	—	—	—	—	937	49	2,409	142
ALL OTHERS.....COAL	969,208	79.3	11,635	1,214	253	—	14,065	27,167	692	594	940,755
	COKE	64.8	69,987	5	—	—	769	3,119	176	176	66,516
TOTALS OF.....COAL	1,217,900	100.0	117,800	13,217	3,386	—	55,106	190,109	40,090	22,842	964,859
	COKE	100.0	108,094	1,777	200	—	5,749	34,630	(c)2,941	3,523	67,000
PERCENTAGE OF WORLD PRODUCTION.....COAL	100	100	9.7	1.1	0.3	—	4.5	15.6	3.3	1.9	79.2
	100	100	25.0	1.6	0.2	—	5.3	32.1	2.7	3.2	62.0

IRON ORE AND PIG IRON

SOURCE OF SUPPLY—BY PRODUCING COUNTRIES

WORLD CONSUMPTION

By Countries	TOTAL QUANTITIES	PERCENTAGE OF WORLD CONSUMPTION	German Customs Union						TOTAL GERMAN CUSTOMS UNION	FRANCE	BELGIUM	ALL OTHERS
			Ruhr (b) and Rhineland	Saar-Palatinate	Lorraine Désannexée	Luxemburg	Rest of Germany					
GERMAN CUSTOMS UNION	15,547 9,366	8.9 11.9	252 7,295	— 1	3,235 973	541 648	1,320 393	5,348 9,310	1,002 1	— —	9,197 55	
	4,600 2,092	2.6 2.6	— 59	— 1,363	3,281 301	240 284	129 84	3,650 2,091	950 1	— —	— —	
	12,214 2,168	7.0 2.7	— 59	— —	11,013 2,100	279 5	10 2	11,302 2,166	912 —	— —	— —	
	8,497 1,397	4.8 1.8	— 22	— —	2,909 2	4,384 1,354	— 17	7,293 1,395	1,201 —	3 —	— 2	
	6,494 3,556	3.7 4.5	— 509	— 7	— 308	— 103	— 6,735 2,566	7,735 3,493	— 4	— —	759 63	
47,352 18,581	27.0 23.5	252 7,944	— 1,371	20,438 3,684	5,444 2,334	7,194 3,062	33,328 18,455	4,065 6	(d) 3 —	9,956 120		
13,260 5,232	7.6 6.6	— 46	— —	479 7	375 13	— 57	854 123	11,850 5,095	92 14	464 (e) —		
7,139 3,047	4.1 3.8	— 95	— —	219 103	1,488 141	28 —	1,735 339	5,036 81	54 2,468	314 159		
107,255 52,246	61.3 66.1	— 83	— —	— 70	24 —	— 242	24 395	967 25	— 3	106,264 51,536		
175,008 79,106	100 100	252 8,168	— 1,371	21,136 3,864	7,331 2,548	7,222 3,361	35,941 19,312	21,918 5,207	149 2,485	117,000 52,106		
100 100	100 100	— 10.3	— 1.7	12.2 4.9	4.2 3.2	4.1 4.2	20.5 24.3	12.5 6.6	— 3.1	70.0 66.0		

* A few words of explanation will be necessary as to the manner in which these tables have been compiled. The imports and exports of Germany, France and Belgium, as well as the figures for production, are taken from the official statistics of each country, the foreign trade figures being those of *commerce special*. The assumption that the total production of 1913 was consumed in that year is of course only approximately correct but accurate enough for the purposes of the present discussion.

The matter of balancing the tables involves difficulties which have been overcome only by making adjustments in the figures included under "all others." For example, the official German figures for exports of coal to France do not correspond with the French official figures for imports from Germany, the difference in this particular case amounting to nearly 6 per cent of the quantities involved. In order to avoid confusion, therefore, the export figures for each country are used to show the distribution of its total production. The total imports of each country are made to correspond with its own official figures by adjusting the figures under "all others." The total consumption of each country, therefore, is assumed to be production + imports - exports.

In working out the consumption of the five subdivisions shown of the German Customs Union, recourse has been had to the German Imperial Traffic Statistics (railways and waterways). This section of the tables—which for the purposes of the present study is by far the most important—has been especially difficult. An attempt has been made to determine for each subdivision the quantity of the particular commodity shipped out of the district by rail and water during the year 1913, as well as the destination of the shipments. In order to make the tables balance it has been necessary to make a large number of estimations and compromises. The result is presented, therefore, not as an exact statement, but as an approximation accurate enough for the purposes of a general survey.

Each table tends to check itself and the different tables tend to check each other. For example, the amount of coke necessary to produce a ton of pig iron from the various ores used in Europe is known in general terms. Similarly, the approximate quantity of these ores required to produce a ton of pig iron is also known. Consequently, the pig-iron production in each district serves as a rough check on both the coke and iron ore consumed there.

(a) Lignite not included. Coal briquettes are included in imports and exports. Consumption of coal includes quantities used to produce coke. Consequently, the figures do not show the actual fuel consumption. In order to arrive at this it would be necessary to add to the total coal consumption the coal equivalent of the coke imports and deduct the coal equivalent of the coke exports. (Usually three tons of coke are considered equivalent to four tons of coal.)

(b) Includes the coal mining district of Aix-la-Chapelle and the Rhine provinces.

(c) French coke production includes only the output of the coking plants connected with the coal mines. About 1,000,000 tons were produced by metallurgical concerns in their own plants.

(d) Belgian figures show exports to Germany and Luxemburg of 574,531 tons of iron ore, although the total production was only 149,000 tons.

(e) French figures (*commerce special*) show total pig iron imports of only 50,400 tons.

divisions of the west-European agglomeration. They will show, in addition, the interchange of these commodities among the four countries of Germany, France, Belgium and Luxemburg; the production and the consumption of each; and finally the exports and imports to and from the rest of the world.

It will be seen that the tables distinguish a great block of territory in central and western Europe, consisting of Germany, France, Belgium and Luxemburg, on the one hand, and the rest of the world on the other. In addition to the distribution of the products of each country and each district of the industrial agglomeration, they show the trade, in terms of these four commodities, of each geographical division or subdivision with other European and extra-European countries. The totals of the vertical and horizontal columns respectively show the production and the consumption of each geographical division.

The figures of greatest significance in the tabulation are of coal and of pig iron: coal because it is the basic motive force in the whole industrial system; pig iron because it represents potential steel. In general the steel production of each country or district is roughly equivalent to the consumption of pig iron, although in the case of the Ruhr and Rhineland the steel output was considerably greater on account of the extensive use of scrap iron.³²

³² According to *Vierteljahrshefte z. Statistik d. D. Reich*, 1916 III, pp. 21-2, the consumption of the steel plants in the Ruhr and

The consuming capacity of neighboring territory has undoubtedly had much to do with the development of the iron and steel industry in western Europe. A comparison between the totals of the vertical and horizontal columns of the tables will show that Germany consumed the equivalent of 82 per cent of her coal output (excluding lignite), the equivalent of 132 per cent of her iron ore output, and 96 per cent of her production of pig iron. France consumed the equivalent of 162 per cent of her coal output, 61 per cent of her production of iron ore, and 100 per cent of her pig iron output. In Belgium the proportions were, 123 per cent of the coal output, nearly 5,000 per cent of the iron ore production, and 123 per cent of the pig iron output.

Taking the Ruhr-Lorraine system as a whole, the percentages of the total *production* consumed in each country and the consumption per capita are shown in the table on page 74.

Of coal and pig iron the three countries taken together produced practically enough for their own consumption. Of iron ore, 9,745,000 tons, or 14 per cent³³ of the total *consumption*, came

Rhineland in 1913 was as follows: pig iron, 7,250,357 tons; scrap, 3,538,363 tons; raw steel output, 9,682,030 tons. In German Lorraine the figures were: pig iron, 2,360,641 tons; scrap, 197,371 tons; raw steel output, 2,280,288 tons. In general a certain percentage of the pig iron consumption is used in foundries for castings, although the scrap used in the steel plants is more than sufficient to make up the difference. In the Ruhr and Rhineland in 1913 the consumption of the foundries amounted to 1,211,000 tons of pig iron, and in German Lorraine to 71,369 tons.

³³It should be noted that the imported iron ore accounted for considerably more than 14 per cent of the pig iron output, due to

Country	Coal ^a		Iron Ore		Pig Iron	
	Per-centage	Per Capita Con-sumption	Per-centage	Per Capita Con-sumption	Per-centage	Per Capita Con-sumption
		Kg.		Kg.		Kg.
Germany (Customs Union)	61	2,600 ^b	82	698	69	275
France	26	1,600	23	335	19	132
Belgium	11	3,470	12	932	11	398
Totals	98	....	117	...	99	...

^a Excluding lignite in the percentage. Coke imports and exports calculated as coal. See note above.

^b In this figure of per capita fuel consumption *lignite is included* at the rate of nine tons to two tons of coal.

from outside sources, principally from Sweden and Spain.

Germany's great fuel supply has made possible her large production and consumption of iron and steel. In the foregoing discussion we have been dealing with commodities that are essentially raw materials. They represent, in a sense, the potentialities of Germany, France and Belgium before the war as industrial nations. The consumption of pig iron was to a very large extent a function of the consumption of coal, and the consumption of coal in the last analysis determined the extent of both the production and the consumption of steel and iron and steel products.

For the purposes of this discussion, the current

the large percentage of Lorraine ores used and the relatively high iron content of the ores from Sweden and Spain.

production of steel and iron and steel products of a country may be considered equivalent in tonnage to the consumption of pig iron. The actual output is of course greater, on account of the use of scrap iron, but this is merely iron that has already been produced and has been included in the output of preceding years.³⁴

	Germany (Customs Union)	France	Belgium
Production (pig-iron consumption)	Tons 18,581,000	Tons 5,232,000	Tons 3,047,000
Imports (exclusive of pig iron) ^a	595,500	412,400	547,400
Production + Imports.....	19,176,500	5,644,400	3,594,400
Exports (exclusive of pig iron) ..	6,484,500	880,800	1,922,200
Consumption iron and steel products ^b	12,692,000	4,763,600	1,672,200
Consumed of own production...	68 per cent	91 per cent	55 per cent
Consumption per capita.....	188 Kg.	120 Kg.	219 Kg.

^a Dr. Zakrzewski, of the *Statistisches Bureau des Vereins Deutscher Eisen- und Stahl Industrieller* adds 33 $\frac{1}{3}$ per cent of imports and exports of iron and steel products in order to obtain the equivalent in pig iron. See *Baedekers Jahrbuch*, 1912-13, p. 766. Thus calculated, the consumption in 1913 would be: Germany, 10,729,000 tons; France, 4,607,500 tons; Belgium, 1,214,000 tons.

^b These tonnages were actually available for use in some form or other, if only to produce scrap to be remelted and used all over again.

³⁴ It is theoretically possible to preserve indefinitely all the iron and steel produced in the world. This is practically realized in the case of the precious metals, platinum and gold for example. But under present conditions the iron and steel in use in the world is oxidized—and therefore lost—at the rate of about 4 per cent a year. The metal is so cheap that, for the present at least, it is not considered economical to go to the expense of further preserving it.

On this basis the consumption of iron and steel products of the three countries under consideration in 1913 is shown in the table on page 75.³⁵

Germany consumed 46.7 per cent, France 18.5 per cent, and Belgium 6.2 per cent of the steel and iron and steel products of all kinds produced in the three countries. Of the total production the equivalent of 28.6 per cent was exported outside the territory of the three countries concerned.

The *production* (or the consumption of pig iron) per capita in each country bears a distinct relation to the coal consumed. Thus Germany in 1913 produced 275 kilograms of iron and steel per capita, or 119 kilograms for every ton of coal consumed; in France the ratio was 132 kilograms per capita, or 83 kilograms per ton of coal consumed; and in Belgium 398 kilograms per capita,³⁶ or 113 kilograms per ton of coal. In order to appreciate the full economic significance of these figures, however, it is necessary to remember that whereas Germany produced more than enough coal for her own consumption, France and Belgium were both heavy importers. France imported in 1913 the equivalent of 38 per cent of her consumption and Belgium 14 per cent.

In the export trade the German steel syndicate played an important role. Apart from its extensive

³⁵ For pig iron consumption see table on p. 70 and note; for imports and exports table on p. 80.

³⁶ Belgium, it should be noted, is the most highly industrialized country, in proportion to its population of about seven and a half millions, in the world.

marketing organization in foreign countries, two methods were used to encourage and to regulate foreign trade: (1) the granting of bounties from the funds of the syndicate to exporters of A-products and to buyers of half-products for use in manufacturing finished products for export; and (2) the conclusion of international agreements with the steel industries of other countries for the allocation of markets.

Much controversy has existed over the first method, both in Germany and in other countries. It has been largely responsible for the accusation from abroad of "dumping," while at home, where the market was protected by high tariffs, the export at low prices of large quantities of half-products has been cited as proof of exorbitant prices exacted from German purchasers.³⁷ An attempt to appraise the merits of the practice here would be out of place; the only point relevant to the present discussion is the fact that the *Stahlverband* was largely instrumental in building up a large export trade. That such was actually the case will be evident from the fact that the quantity of A-products sold abroad by the syndicate increased from 1,278,600 tons in 1904-5 to 2,120,000 tons in 1912-13,³⁸ and that the total exports of iron and steel of all kinds increased

³⁷ Particularly by the straight rolling mills. See Tosdal, *Quarterly Journal of Economics*, January, 1917, and numerous articles in *Kartell Rundschau*.

³⁸ *Baedekers Jahrbuch, Dortmund* 1912-13, p. 778. The years are from March to March, inclusive, in reality 13 months.

from 2,771,000 tons in 1904 to 7,341,000 tons in 1913.³⁹

Accurate and complete data concerning the international agreements are difficult to obtain. But there can be no doubt that such agreements did exist before the war for certain commodities, particularly steel rails. As early as 1904 an international rail cartel was formed under the leadership of the *Stahlverband*, whereby German, English, Austrian, American and Belgian producers agreed to share the market in various countries and territorial divisions. The organization continued to function until interrupted by the war. Other agreements were also made with French and Belgian concerns with respect to the market for half-products and certain classes of structural steel.⁴⁰ The existence before the war of such marketing agreements is of interest primarily because it demonstrates the possibility of international understandings, even among competing countries, when economic intercourse is not hampered by politics.

The Ruhr-Lorraine system had become a main source of supply for the international iron and steel market. A comparison of the total exports in 1913 from Germany, France and Belgium on the one hand, and from Great Britain and the United States on the

³⁹ For 1904 see *Baedekers Jahrbuch, Dortmund* 1912-13, p. 768; for 1913 see table on p. 80.

⁴⁰ See Tosdal, *Quarterly Journal of Economics*, February, 1917, p. 267; also *Kartell Rundschau*, 1904, p. 401; 1906, pp. 160 and 693; *Stahl ú Eisen*, 1913, p. 382.

other will make this clear. The figures are as follows: ⁴¹

Total Iron and Steel exports (including machinery) from:

Germany (customs union)	7,341,000	tons	(metric)
France	993,500	"	"
Belgium	1,938,900	"	"
Great Britain	4,935,200	"	(gross)
United States	1,344,400	"	"

Nearly the whole of the iron and steel exported from Germany, France and Belgium originated in territory comprising the Ruhr-Lorraine system. The following tables will show (A) the total foreign trade of each of the three countries in 1913 according to a general classification of products and (B) the trade in all iron and steel products of each country according to the source of the imports and the destination of the exports.⁴²

It will be observed (from table A) that the exports of Germany and Belgium were composed very largely of finished products, while their imports consisted principally of iron and steel in the cruder forms. In France, on the contrary, the exports were mainly of

⁴¹ Figures for Great Britain and the United States from: British Bd. of Trade, *Accounts of Trade & Navigation of the U. K., and of Certain Foreign Countries*, December, 1913, p. 170; January, 1914, p. 49. For Germany, France and Belgium see table on p. 80, this book.

⁴² Figures in both tables compiled from official foreign trade statistics (*commerce special*) of Germany, France and Belgium for 1913. They include, of course, exports and imports of the three countries to and from each other.

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A—FOREIGN TRADE IN 1913 ACCORDING TO CLASS OF IRON AND STEEL PRODUCTS (THOUSANDS OF METRIC TONS).

Class of Commodity	Germany (Customs Union)		France		Belgium	
	Im- ports	Ex- ports	Im- ports	Ex- ports	Im- ports	Ex- ports
Pig iron and raw alloys.	126.4	856.5	50.4	112.7	579.4	16.7
Scrap	213.6	196.3	24.7	226.0	123.9	152.8
Crude Steel and half- products	11.0	700.8	34.6	326.0	81.4	153.9
Railway Material (rails, etc.) ^a	1.6	748.9	2.8	77.1	8.6	164.6
Structural Steel	25.7	1,621.1	^d	^d	74.2	995.7
Other iron and steel products ^b	240.5	2,379.9	49.3 ^c	20.2 ^e	142.7	244.6
Machinery ^c	103.1	838.5	301.0	231.5	116.6	210.6
Total	721.9	7,341.0	462.8	993.5	1,126.8	1,938.9

^a In Germany, A-products.^b In Germany, including B-products.^c Tonnage for machinery somewhat too large, since machinery not altogether constructed of iron.^d French imports and exports of structural steel in the official figures are included in the figures for half products under, "*laminés ou forgés en blooms, billettes et barres, toles.*"^e Includes rolled products such as sheets.

crude steel and scrap. The explanation, just as in the production and consumption of iron and steel, lies in the fact that Germany and Belgium were relatively better supplied with coal than France, and were thereby enabled to work up a larger proportion of their crude metal into finished products.

Great Britain was Germany's most important customer. From the point of view of the future international status of the Ruhr-Lorraine system, this is perhaps the most significant fact shown in table B.

B—FOREIGN TRADE IN 1913 IN ALL IRON AND STEEL (INCLUDING MACHINERY) ACCORDING TO PRINCIPAL COUNTRIES *

(Thousands of metric tons)

Imports from—or Ex-ports to—	Germany (Customs Union)		France		Belgium	
	Im-ports	Ex-ports	Im-ports	Ex-ports	Im-ports	Ex-ports
Great Britain	227.2	1,237.7	113.7	44.7	48.7	473.4
British Dominions and Dependencies	11.0	543.7	5.2	3.5	6.8	300.6
Holland	5.7	666.7	2.8	0.6	40.5	120.6
Austria-Hungary	46.0	409.4	3.8	0.3	0.3	1.2
Russia (in Europe).....	8.4	306.0	0.0	4.1	0.5	15.7
Italy	3.6	332.7	1.5	70.2	0.7	43.9
Switzerland	16.3	361.2	15.6	78.1	1.0	4.9
Spain	4.1	99.4	0.3	15.9	3.3	52.7
Sweden - Norway and Denmark	100.3	496.1	32.7	2.2	5.2	41.9
<i>Germany</i> .....	...	....	157.5	57.9	684.6	114.1
<i>France</i>	62.5	296.8	...	....	175.8	120.7
<i>Belgium</i>	120.7	702.4	78.5	418.9	....	....
Other European	3.1	355.5	0.0	3.8	1.9	114.9
United States	56.0	71.0	42.3	2.0	14.0	7.7
Argentina and Brazil....	2.2	546.1	0.0	45.1	3.7	175.9
Japan and China.....	1.9	343.5	0.0	0.6	1.5	112.6
Africa (except British Africa)	0.0	106.7	0.0	200.1	2.7	34.6
All others	52.9	466.1	8.9	45.5	135.6	203.5
Totals	721.9	7,341.0	462.8	993.5	1,126.8	1,938.9

* Since figures are for *commerce special*, they do not show quantities imported for re-export. Consequently there is a considerable difference between the exports and imports of the three countries to and from each other. The difference is rather striking as between the exports of France to Belgium and the imports of Belgium from France.

The importance of the trade between the two countries becomes still more apparent when it is remembered that Holland played an important rôle as an intermediary. To a considerable extent the exchanges of iron and steel represented partly-finished products which the one country was better able to produce than the other. Thus Germany and Great Britain, in so far as the exchanges were of this nature, were in reality co-operating rather than competing.

But the full economic significance of the trade between Germany and Great Britain can be appreciated only if the total exchange of goods be considered. Germany exported to Great Britain much more iron and steel than she imported from that country; but on the other hand, Great Britain exported to Germany much larger quantities of a number of other products. The total value (in gold) of Germany's trade with Great Britain in 1913 was as follows: Exports to Great Britain, 1,608,000,000 marks; imports from Great Britain, 1,210,000,000 marks.⁴³ In the total export trade Great Britain was Germany's largest customer, and Germany was Great Britain's largest customer except India. Of the total exports in 1913 of Great Britain, nearly 10 per cent went to Germany, and of her total imports 10.46 per cent came from Germany. Like all the

⁴³ *Material for a Study of Germany's Economy, Currency, and Finance*, by order of the German Government (prepared for Dawes Committee) 1924, p. 19. (Sterling converted to marks at 1£ = 20 marks).

industrial nations in the world, Germany and Great Britain were competitors; but to an even greater extent they were economically inter-dependent.⁴⁴

Such, in brief outline, was the organization in Western Europe for the production and distribution of iron and steel at the outbreak of the World War. All western Germany, including Lorraine and Luxemburg, was a veritable network of interlocking vertical and horizontal combinations, composing the Ruhr-Lorraine industrial system. France and Belgium, also, were intimately bound up with that system on account of their dependence upon the Ruhr for coal and coke and upon Lorraine for iron ore.

As one of the three great coal and iron producing centers of the world the Ruhr-Lorraine system was supplying the needs not only of the greater part of Continental Europe but an ever increasing part of the needs of the world. It was in active competition with the other two great centers of production, Great Britain and the United States. In a civilization based on the ever expanding consumption of power derived from coal, and of iron and steel that can be produced only by a fortunate combination of coal and iron ore, the industrial organization in the relatively small region spreading over the borders of four countries in western Europe has assumed an importance out of all proportion to the extent of the area involved.

⁴⁴ For further discussion of this, in connection with the future of the Ruhr-Lorraine system, see Chap. X.

PART II

THE PROBLEM OF REPARATION
COAL AND COKE

CHAPTER IV

COAL AND IRON UNDER THE PEACE TREATIES

As an organization for the production of coal, iron, and steel, the Ruhr-Lorraine system functioned straight through the war without interruption. At the very beginning of the struggle Germany seized the French part of the Lorraine iron fields, and shortly thereafter she had obtained possession of all the coal mines in Belgium and most of those in northern France, thus securing complete control of all the basic elements of one of the greatest industrial centers in the world. Consequently the Ruhr-Lorraine industrial system was operated during the four years of warfare even more as an economic unit than before.

To a large extent the same condition was realized with respect to the distribution of the industrial output. It is true that the far-flung international organization for the marketing of iron and steel products was disrupted; but as far as the great central portion of the European continent was concerned the pre-war organization for distribution was not only maintained intact but its various elements were welded even more closely together. The broad expanse of territory stretching across Europe from the

North and the Baltic seas to the Adriatic and the Bosphorus had already attained a high degree of economic unity, and the war had the effect of hastening a process of evolution that had been going on for years. The Central Powers, due to the geographical position of the territory under their control and to the necessities imposed by the Allied blockade, were obliged to develop an organization for the production and distribution of goods which was even more dependent upon a high degree of economic internationalism than that which had existed in the same territory before the war. And the mainspring of that organization was the Ruhr-Lorraine industrial system.

At the end of the war this great economic unit was literally torn to pieces. The territory over which it extended was broken up by national frontiers and divided among a dozen independent states,¹ most of them, particularly the newly created or restored nations, inspired by intense patriotism to hate and distrust their neighbors. The iron ore of the Ruhr-Lorraine system was separated from the coal, various countries in Central Europe were cut off from their normal fuel supply, and the comparative freedom of exchange for raw materials and goods of pre-war days was superseded by a tendency to magnify the economic importance of the new network of political frontiers.

¹ France, Belgium, Germany, Poland, Czechoslovakia, Roumania, Bulgaria, Hungary, Austria, Yugoslavia, Italy, and Greece.

Such was the economic situation confronting the Peace Conference at the beginning of the year 1919. The formula of the self-determination of nations, which was the dominant international concept of the time, was essentially political; it took practically no account of economic considerations. And yet the statesmen assembled in Paris were able to see that the indiscriminate application of this formula was already in a fair way to wreck the economic structure of Europe. They realized that comprehensive measures of some kind must be taken to mitigate the consequences of what appeared to be the political necessities of the peace settlement.

At the heart of the immediate economic problem was the question of the distribution of fuel, both for the re-establishment of production in the disrupted Ruhr-Lorraine system and for the revival of industrial activity throughout the European continent. Consequently a special section of the Peace Conference was assigned the task of working out a solution of the problem of coal distribution.

What the Peace Conference did, both directly by the provisions of the treaties and indirectly by the creation of administrative machinery, constitutes an experiment on a huge scale in the application of political methods to the solution of economic problems. The experiment, moreover, has not yet been completed; it is still going on. For many years to come the Reparation Commission and the various arbitral agencies contemplated by the Protocol of

London of August 16, 1924, in connection with the operation of the Dawes plan, will be confronted with essentially the same problems of fuel distribution that have so vitally affected the Ruhr-Lorraine system in the past.

It is for this reason, as well as for the purpose of obtaining a more comprehensive understanding of the Ruhr-Lorraine industrial problem as it exists today, that the second part of our study is devoted to a somewhat extended analysis of the German coal and coke deliveries on the reparation account and the broader aspects of fuel distribution in Europe. Before taking up this discussion, however, it will be of advantage to have in mind a clear cut conception of just what was the dominant purpose of the Peace Conference with respect to coal. Positively stated, that purpose was to secure from the Central Powers reparation payments; but the economic necessities of the situation were such as to render absolutely imperative a broader view of the question of coal deliveries. Taken as a whole, therefore, the end sought by the Peace Conference was two-fold:—it was the collection of reparation payments in a form particularly acceptable to the Continental Allies, on the one hand, and on the other, the reconstruction of the European economic system through a well-considered distribution of the fuel available. As we shall see from our analysis, these two aims were in practice often conflicting.

The great reservoir of coal on the Continent is

Germany—in the Ruhr district and in Upper Silesia. All other Continental countries, with the exception of Czechoslovakia, were at the time of the Peace Conference largely dependent upon imported coal. France in particular was in need of coal to compensate the shortage for some years to come in the output of her northern mining districts, and along with her requirements for industrial and domestic fuel in general she needed an assured supply of coke for her blast furnaces in Lorraine. In central Europe it was of the highest importance that certain countries such as Austria and Hungary, which had been cut off by their new frontiers from their normal fuel supply, should be provided with the opportunity of purchasing coal from their neighbors.

With a view to meeting the urgent requirements of the situation, provisions were made in the Armistice agreements and in the various treaties of peace for dealing with most of the broader aspects of the fuel problem. Since at the time of the Peace Conference that problem appeared to be primarily one of coal distribution, the conflict between national reparation and general economic reconstruction was not clearly defined. Indeed, due to the comparatively large fuel supply of Germany, there was reason to believe that the delivery to the Allies of considerable quantities of coal and coke on the reparation account would tend to promote a more general revival of industrial activity throughout Europe than could be secured in any other fashion. It may

be safely asserted, therefore, that taken in their entirety, the measures adopted were conceived on a large scale and designed to aid materially in the recovery of the Continental nations from the ravages of the war.

I. PROVISIONS FOR THE RUHR-LORRAINE SYSTEM

The surrender of Germany, in November, 1918, was followed by an immediate change in the Franco-German frontier. Lorraine and Alsace were returned to France and the French army took over the Saar territory and the administration of the coal mines in that district. The iron and steel plants of German Lorraine and the Saar were practically intact at the end of the war, and in view of the very great importance of the iron and steel industry in the economic life of Europe it was urgently necessary that the industrial activity of these regions should not be interrupted.

It was realized during the Armistice negotiations that provision must be made for a continued exchange of Ruhr coke for Lorraine iron ore. A very imperfect agreement was concluded on December 25, 1918, in the city of Luxemburg, providing for the delivery to the Lorraine blast furnaces of certain quantities of coke from Westphalia in exchange for iron ore, in the ratio of four tons of coke to five tons of ore. The Protocol of Luxemburg, which is the name applied to this agreement, was somewhat vague and indefinite. In reality it settled nothing

conclusively, owing to the number of reservations incorporated in the document by the German representatives.

For about six months after the first Armistice agreement the Germans supplied very little coke to Lorraine. Naturally they received only insignificant quantities of iron ore in return. The result was that the Lorraine iron industry was practically at a standstill during this period; while, on the other hand, the Westphalian iron masters suffered very little, owing to the fact that iron ore is easily stored and they had on hand considerable stocks. To the demands of the Allies for the delivery of coke, the Germans replied by referring to the reservations they had incorporated in the Protocol of Luxemburg. It was not until May 6, 1919, in fact, that a *modus vivendi* was agreed to and shipments of coke from the Ruhr were resumed. From that time forth deliveries in exchange for iron ore were more or less regular, although not nearly up to the requirements of the Lorraine blast furnaces.

The coke deliveries under the Protocol of Luxemburg continued theoretically until January 10, 1920, when the Treaty of Versailles began to operate. By a later agreement, however, they were reckoned after September 1, 1919, as deliveries in anticipation of the treaty requirements. The prices, both for the coke and for the iron ore, as well as for the coal received by France from the Saar mines before the coming into force of the Treaty, were to be fixed by

a common agreement later on and paid in cash. It may be of interest here to note that the French and the German representatives were never able to agree on these prices and that by common consent the question was referred for arbitration to Colonel James A. Logan, American Unofficial Delegate to the Reparation Commission. The prices fixed by Colonel Logan were accepted as satisfactory by both sides to the controversy.

By a provision of the Treaty of Versailles the Saar coal mines were ceded to France. According to the terms of the Treaty this cession was made "in part payment for the devastated mines" of the north of France,² but according to the theory of a general European coal policy which was taking vague form in the councils of the Peace Conference in the spring of 1919, the products of the Saar mines would be approximately sufficient to cover the requirements of Alsace-Lorraine. It is a fact that the production of these mines in 1913 was roughly equivalent to the coal and coke consumption of Alsace-Lorraine and of the Saar region in the same year.³

The Saar mines were taken over by France almost immediately after the Armistice. There can be no doubt that this created an unfortunate impression in Germany, particularly in view of the fact that practically all the coal produced beyond the requirements of the Saar region itself was shipped either

² Article 45 of the Treaty of Versailles.

³ See table on p. 69, Chap. III.

to Alsace-Lorraine or to other parts of France, while the consumers in southern Germany who had normally been supplied with this coal were obliged to satisfy their needs from the limited supply furnished by the Ruhr. Moreover, the immediate seizure of these mines by France seemed an unmistakable indication that she intended to keep them permanently. It is at least reasonable to suppose that the German reluctance to execute the terms of the Protocol of Luxemburg might be partly attributed to resentment over this matter.

The dependence of the Lorraine iron industry on the Ruhr for its coke supply was specifically recognized in the Treaty of Versailles. Among the most important provisions of that treaty was the stipulation that of the coal deliveries to be made to France for a period of 10 years, a certain proportion, to be specified by the Reparation Commission, were to be in the form of metallurgical coke, in the ratio of three tons of coke to four tons of coal.

This stipulation was the result of a carefully considered plan on the part of the Peace Conference to ensure the continuity of the Ruhr-Lorraine system. It is true that no specific provision was made for the shipment of iron ore to the Ruhr, but it was considered safe to assume that once the movement of coke to Lorraine was re-established the return of iron ore in exchange would follow naturally. Subsequent events have at least partly justified the assumption, although the quantities of both coke and iron ore

involved have been considerably less than before the war.

II. THE COAL CLAUSES OF THE TREATY OF VERSAILLES

From the beginning of the Peace negotiations it was realized that the question of coal must inevitably play an important part in the future relations between the Allies and Germany. It was imperative, therefore, that those clauses of the Treaty dealing with coal should be drawn with the utmost care. They had to be flexible enough to meet whatever modified conditions might prevail in the years to come, and at the same time it was necessary that they should be specific enough to guarantee to the Continental Allies, who had been normally dependent on German coal before the war, an equitable degree of satisfaction of their needs, in so far as the coal production of Germany would permit. Moreover, special compensation had to be provided for the mines destroyed by the German armies in the north of France.

The coal demands form the subject of a separate annex of the reparation clauses of the Treaty of Versailles. They are a part of the general stipulations for reparation in kind, which were intended to provide the Allied countries with certain raw materials and goods particularly needful in the reconstruction of the devastated areas. A chapter in the appendix of this book ⁴ will be devoted to a dis-

⁴ See Appendix A, p. 277.

cussion of the general program of reparation in kind and the manner in which it has been carried out. Here it is only necessary to point out that the matter of coal deliveries was of such particular importance that it was deemed necessary to make specific provisions in the Treaty to cover it. In order to provide flexibility, the stipulations were drafted in the form of options, in favor of France, Italy and Belgium, which were to be executed through the intermediary of the Reparation Commission. Since it will be necessary frequently to refer to them in the discussion which follows, they are given below verbatim.

Annex V—Part VIII—Treaty of Versailles.

1.

Germany accords the following options for the delivery of coal and derivatives of coal to the undermentioned signatories of the present Treaty.

2.

Germany undertakes to deliver to France seven million tons of coal per year for ten years. In addition, Germany undertakes to deliver to France annually for a period not exceeding ten years an amount of coal equal to the difference between the annual production before the war of the coal mines of the Nord and Pas de Calais, destroyed as a result of the war, and the production of the mines of the same area during the years in question: such delivery not to exceed twenty million tons in any

one year of the first five years, and eight million tons in any one year of the succeeding five years.

It is understood that due diligence will be exercised in the restoration of the destroyed mines in the Nord and the Pas de Calais.

3.

Germany undertakes to deliver to Belgium eight million tons of coal annually for ten years.

4.

Germany undertakes to deliver to Italy up to the following quantities of coal:

July, 1919, to June, 1920	4½ million tons
“ 1920 “ “ 1921	6 “ “
“ 1921 “ “ 1922	7½ “ “
“ 1922 “ “ 1923	8 “ “
“ 1923 “ “ 1924	8½ “ “

(and each of the following five years)

At least two-thirds of the actual deliveries to be land-borne.

5.

Germany further undertakes to deliver annually to Luxemburg, if directed by the Reparation Commission, a quantity of coal equal to the pre-war annual consumption of German coal in Luxemburg.

6.

The prices to be paid for coal delivered under these options shall be as follows:

- (a) For overland delivery, including delivery by barge, the German pithead price to German nationals, plus the freight to French, Belgian,

Italian or Luxemburg frontiers, provided that the pithead price does not exceed the pithead price of British coal for export. In the case of Belgian bunker coal, the price shall not exceed the Dutch bunker price.

Railroad and barge tariffs shall not be higher than the lowest similar rates paid in Germany.

- (b) For sea delivery, the German export price f.o.b. German ports, or the British export price f.o.b. British ports, whichever may be lower.

7.

The Allied and Associated Governments interested may demand the delivery in place of coal of metallurgical coke in the proportion of 3 tons of coke to 4 tons of coal.

8.

Germany undertakes to deliver to France, and to transport to the French frontier by rail or by water, the following products, during each of the three years following the coming into force of this Treaty:

	Tons
Benzol	35,000
Coal tar	50,000
Sulphate of ammonia	30,000

All or part of the coal tar may, at the option of the French Government be replaced by corresponding quantities of products of distillation, such as light oils, heavy oils, anthracene, naphthalene or pitch.

9.

The price paid for coke and for the articles referred to in the preceding paragraph shall be the same as the

price paid by German nationals under the same conditions of shipment to the French frontier or to the German ports, and shall be subject to any advantages which may be accorded similar products furnished to German nationals.

10.

The foregoing options shall be exercised through the intervention of the Reparation Commission, which, subject to the specific provisions hereof, shall have power to determine all questions relative to procedure and the qualities and quantities of products, the quantity of coke which may be substituted for coal, and the times and modes of delivery and payment. In giving notice to the German Government of the foregoing options, the Commission shall give at least 120 days' notice of deliveries to be made after 1st January, 1920, and at least 30 days' notice of deliveries to be made between the coming into force of this Treaty and 1st January, 1920. Until Germany has received the demands referred to in this paragraph, the provisions of the Protocol of 25th December, 1918 (Execution of Article VI of the Armistice of 11th November, 1918) remain in force. The notice to be given to the German Government of the exercise of the right of substitution accorded by paragraphs 7 and 8 shall be such as the Reparation Commission may consider sufficient. If the Commission shall determine that the full exercise of the foregoing options would interfere unduly with the industrial requirements of Germany, the Commission is authorized to postpone or to cancel deliveries, and in so doing to settle all questions of priority; but the coal to replace coal from destroyed mines shall receive priority over other deliveries.

The primary object of the coal clauses of the Treaty of Versailles was to secure for the Allies sufficient fuel for reconstruction. They were not designed merely to provide France, for example, with an amount of coal equivalent to her pre-war production. Had this been the intention, it would have been necessary only to add some seven or eight million tons per year to the output available from the Saar mines in order to compensate the loss of production in the devastated mines in the north of France. The object in view was much broader; it was first of all to provide for the Allied countries an adequate supply of a much needed commodity, and secondly, to secure reparation payments, the emphasis being placed on the actual movement of coal rather than on the transfer of money value.

It will be noted that a special provision was made for the delivery to France of the coal necessary to replace the loss of output in the devastated mines of the Nord and Pas de Calais, and that the quantities were limited both as to time and tonnage. These deliveries, moreover, were to be made in priority over all others, as stipulated in paragraph 10 of the Annex. Whatever the justice of the cession of the Saar mines, the provision for coal to replace the output of the damaged collieries in northern France has been widely recognized, even in Germany, as just and equitable beyond dispute.

In the other demands for coal the intention was, in theory, to provide for the delivery to France,

Italy, and Belgium over a period of 10 years, of quantities roughly equivalent to the imports from Germany of those countries before the war. It is true that the tonnages specified were the result of a very liberal interpretation of the theory, inasmuch as they were almost double the pre-war importations, but it should be remembered that the stipulations were in reality options, and the Reparation Commission was left free to demand as much or as little as it saw fit.

Until the end of the war the Grand Duchy of Luxemburg had belonged to the German Customs Union and received without difficulty as much coal and coke as it required. But now its economic relations were to be changed, and in order to insure impartiality on the part of Allies, who might conceivably wish to influence its future by economic pressure, the Reparation Commission was empowered to demand German coal for the Luxemburg consumers.

The question of coal prices was distinct from that of quantities. It will be noted that in paragraph 6 of the Annex two categories of shipments are provided for: those by land or inland water; and those by sea. The underlying theory of prices in the Treaty was two-fold: (1) to safeguard the Allies against prices higher than those paid by German consumers; and (2) to insure Germany a fair price for coal delivered by sea, on the assumption that if she exported this coal in the ordinary manner she

would receive world market prices. Moreover, an additional reason for this latter stipulation was to avoid unfair competition with the British export coal trade.

It should be remembered that an unusual situation existed at the time the Treaty was drafted. There was a pronounced coal shortage in Europe and prices were rigidly controlled by the governments in all countries. Great Britain, being the only country which produced an export surplus, fixed two prices: one for British consumers and one for export, the latter being from two to three times as high as the internal price. Under the circumstances, and in view of the fact that it was impossible to foresee the subsequent demoralization of the German fiscal system which entailed, through the fall in value of the mark, an enormous difference in the internal price of German coals and the internal price in other coal producing countries, it is probably safe to say that the price stipulations of the Treaty were drawn as equitably as was possible at the time. They appeared to guarantee to Germany a fair credit on the reparation account for the deliveries made, and at the same time to provide the Allies with a basic raw material vital to their economic rehabilitation.

The delivery of certain derivatives of coal to France, specified in paragraph 8 of the Annex, was demanded for the purpose of meeting a temporary shortage of those particular products. The question of benzol was of the most immediate importance.

Mention has already been made of the provision for a coke supply to France. The stipulation applied equally to the deliveries to the other Allies and to Luxemburg, to whom the question of coke supply is of supreme importance. Belgium has required a certain amount of coke, although not so much as France and Luxemburg. Italy, on account of transportation difficulties, has demanded little or none.

The Reparation Commission was empowered and obligated to demand coal deliveries only to the extent to which the supply available in Germany would permit. Coupled with the stipulation for the delivery of coke, this provision in paragraph 10 of the coal Annex has proved to be the most important of all the coal clauses of the Treaty. It has given the Commission very wide powers over the economic life of Germany, to say nothing of its power to promote the economic recovery of France, Italy, and Belgium.

One stipulation of this paragraph—that which requires 120 days' notice to Germany of deliveries to be made after January 1, 1920—has proved impracticable of application. It caused considerable confusion and difficulty during the early days of the execution of the Treaty, but after the deliveries had really commenced in earnest, both the Reparation Commission and the Germans by common consent allowed the stipulation to become ineffective. Before the Conference of Spa in July, 1920, however, it had a very important technical bearing on the

question of Germany's first default.⁵ On the whole, however, the stipulations of paragraph 10 were so drawn as to accord with the wider European coal policy which was taking form in the spring of 1919, and which will now be discussed.

III. THE EUROPEAN COAL POLICY OF THE PEACE CONFERENCE

Reference has already been made to the peculiar problems of the coal supply of post-war Europe. It has been pointed out that the end of the four years' struggle was accompanied by the disruption of the system of distribution which had been a natural result of industrial expansion in Europe during the preceding half-century, and of the slightly different and much more compact system which had been developed in central Europe during the war itself. But the fuel problem was also complicated by the fact that Europe as a whole was confronted with an absolute shortage of from 25 to 30 per cent of her pre-war coal production. Even before the end of the war the Supreme Economic Council of the Allied and Associated Powers had been studying in anticipation the great problems which were certain to arise in connection with raw materials. In the early spring of 1919, when the terms of the Treaties of St. Germain (with Austria) and Trianon (with Hungary) were under consideration, it was realized that the problem of coal production and distribution

⁵ See Chap. V., p. 128.

was destined to be of vital importance to the economic life of the newly created states in central Europe.

The great reservoir of coal for central Europe is Upper Silesia. The treaties of St. Germain and Trianon separated Austria, Hungary, and to a lesser extent other countries, from their natural coal supply by national frontiers. As the second largest coal field in Europe, the Silesian basin is the natural source of supply for the greater part of the territory comprising the old Austro-Hungarian Empire. A relatively small though very important part of the Silesian basin lies in what is now Czechoslovakia—the Mährisch-Ostrau and Teschen districts. These regions were formerly a part of the old Empire, and Austria and Hungary, and to a certain extent Yugoslavia and Poland, depended upon the Mährisch-Ostrau and Teschen mines for practically all of their high-grade gas and coking coals. The bulk of their remaining requirements came from Upper Silesia, which contains something like 85 per cent of the entire Silesian basin.

An eastern extension of the Silesian basin, the Galician coal mining region, was incorporated in Poland. But the ownership of the great bulk of the basin, in Upper Silesia, was to be decided as between Germany and Poland by a plebiscite. In the meantime the territory was to be governed by an international commission, although it was to remain nominally a part of Germany.

It is thus clear that Poland and Czechoslovakia were already in possession of an important part of the natural coal supply of Austria and Hungary, and that Poland might by the plebiscite secure practically the whole of the remainder. In order to assure as far as possible an equitable distribution of this coal two similar clauses, Articles 209 and 207, were incorporated in the treaties of St. Germain and Trianon respectively. These provided that both Poland and Czechoslovakia should permit the exportation of coal to Austria and Hungary respectively, under conditions as favorable as those accorded to Czechoslovak and Polish nationals at home, and in quantities proportionate to those supplied to the same territories before the war. It was further provided that in case agreements could not be reached between the parties immediately concerned, the Reparation Commission might be called upon to specify the quantities of coal to be supplied to Austria and Hungary by both Czechoslovakia and Poland.

One other coal provision of the Treaty with Hungary should be mentioned, to show the far-reaching measures taken by the Peace Conference to minimize the economic consequences of breaking up the old Austro-Hungarian empire. A certain small coal field known as the Pecs basin, near the southern border of present Hungary, before the war supplied the fuel requirements of the railroads and river shipping of what is now northern Yugoslavia. It

was stipulated in the reparation clauses of the Treaty of Trianon that Hungary should furnish Yugoslavia for a period of five years with a certain quantity of coal from the Pecs mines, to be fixed periodically by the Reparation Commission.

But all these treaty provisions could, in the nature of things, function only when the treaties were ratified and in force, and the need for relief of the disrupted coal distribution in Europe was immediate. With a view to ascertaining the real situation and in the hope of formulating a general European coal policy, the American Relief Administration under the direction of Mr. Herbert Hoover and in co-operation with the Supreme Economic Council, sent a mission of investigation to central Europe. This mission was occupied during the greater part of the summer of 1919 in making a study of the mining and social conditions in the Silesian basin. Investigations were also made in Austria, Hungary and Yugoslavia. The gist of the report submitted to the Relief Administration and the Supreme Economic Council was that coal production in Central Europe was about 30 per cent below the pre-war figure, and that the basic cause of this was the shortage of food and clothing, complicated by social unrest.

It became evident that some co-ordinated general coal policy was vital to European recovery. Even with the coal Great Britain would be able to export to the Continent, there would still be a shortage of about 30 per cent of the pre-war normal needs, for

the British mines were also underproducing by about the same percentage as the rest of Europe. The continued importation of American coal on a large scale was financially impossible. It was inevitable, therefore, that the Continent would have to get along as best it could, at least for a few years, on considerably less coal than it had consumed before the war, in spite of the fact that its potential consuming capacity, in view of reconstruction needs, was fully as great, if not greater.

The immediate problem was to secure an equitable distribution of the coal available. In the late summer of 1919 there was organized, at the suggestion of Mr. Herbert Hoover, the European Coal Commission. This commission was an outgrowth of the mission of investigation to central Europe above referred to, and was composed of the representatives and coal experts of the Allies in Paris at the time. The powers of the Commission were merely advisory; but it undertook, with some success, to establish the principle that each country should, as far as the available supply would permit, be furnished with coal in proportion to the pre-war consumption of the particular territory concerned.

Since the frontiers of the new countries in central Europe seldom correspond with any political or economic subdivisions of the pre-war states, the difficulties of the task of determining pre-war coal consumption may well be imagined. Nevertheless, this work was organized and begun by the European Coal

Commission and was later completed by the Reparation Commission. A sub-commission was installed at Mährisch-Ostrau, near the border of Upper Silesia in Czechoslovakia, to continue the work of the Mission of Investigation and to use whatever influence it could to effect an equitable distribution of coal in central Europe. This organization was known as the Central European Coal Commission, and later it became a bureau of the Reparation Commission.

International control of the Upper Silesian coal output was imperatively required. Only thus could certain countries in central Europe be assured of an equitable and adequate supply. This was in fact obtained for a time by a felicitous combination of circumstances. Simultaneously with the functioning of the European Coal Commission in the autumn of 1919 the Reparation Commission was being organized by a committee of the Peace Conference, a subdivision of which was dealing with coal. Since the personnel was largely the same in both organizations, their work was readily co-ordinated. Already the Reparation Commission had been given wide powers by the various treaties in the matter of coal distribution, but as yet it had no means of securing for Austria, Poland, and Hungary the proportionate quantities of Upper Silesian coal to which they were entitled.

It has been pointed out that Upper Silesia, which contains the second largest coal field on the conti-

ment of Europe, was to be governed by an inter-Allied commission during the interim between the coming into force of the Treaty of Versailles and the completion of the plebiscite. Since the time involved was estimated to be at least a year (in reality it turned out to be over two years), it was realized that this commission would be empowered to regulate the distribution of the coal produced in the district during the most difficult part of the reconstruction period. In order to concentrate as far as possible the direction of European coal distribution in a single agency it was proposed to the Supreme Council of the Allies, by joint action of the European Coal Commission and the organization committee of the Reparation Commission, that during the pre-plebiscite period in Upper Silesia the governing commission should distribute the coal produced in that territory according to the instructions of the Reparation Commission.

The proposal was accepted by the Supreme Council and incorporated in a decision, which provided in addition that until instructions were issued by the Reparation Commission certain specified quantities of coal should be exported to Austria and to Poland, the remainder of the output being left, of course, for consumption in Upper Silesia and for the general requirements of Germany. Later on, after the Reparation Commission was officially created, certain allocations of coal were made to Hungary and additional quantities were supplied to Austria.

It is a matter of considerable satisfaction to the two Americans who devised this plan ⁶ that it functioned for more than two years after the coming into force of the Treaty of Versailles, and that the currents of coal distribution thus re-established have continued to flow with slight modifications until the present time.

IV. THE POTENTIAL RÔLE OF THE REPARATION COMMISSION

The Reparation Commission, perhaps more definitely than the League of Nations, was created as a practical expression of the relatively new idea of international economic administration. In theory, at least, it was to be a sort of Supreme Court of Europe,—issuing economic judgments independently of the Allied governments which called it into being. In addition to its main task of assessing the reparation debt and determining ways and means of collecting the sums due from Germany and her allies, it was to assume some of the functions not only of a bankruptcy court but also of a receivership under the orders of the same court.

As a court, it was the duty of the Commission to administer the affairs under its jurisdiction in the interest of justice; as a receiver, its task was to safeguard the prosperity of Germany and her allies in order to insure their capacity to pay. Every reason existed, therefore, both of abstract justice and of

⁶ Colonel James A. Logan and the author.

self-interest, to make it incumbent upon the Reparation Commission to work for the genuine reconstruction of Europe. It was on this general theory that the Commission was organized in the autumn of 1919.⁷

The Reparation Commission was destined to become for a time the chief agency for distributing coal throughout Europe. Reference has already been made to the provisions in the Treaty of Versailles for reparation in kind. In the light of subsequent developments in the European economic situation it may now be safely declared that the coal stipulations were among the most important of all the reparation clauses of the Treaty. While forming a part of the general scheme of reparation in kind, they were nevertheless so drafted as to supplement a still more general economic program. The Reparation Commission was in fact placed in the position of an arbiter of the industrial reconstruction and development of the greater part of the European Continent.

By the provisions of the treaties of Saint Germain and Trianon above referred to, coupled with its authority over the distribution of Upper Silesian coal, the position of the Commission as coal distributing agent was extended to all the territory of the former Austro-Hungarian and German Empires.

⁷ The Reparation Commission was designed to handle the whole problem in as enlightened a manner as the plan of the Dawes Committee is now expected to do. For a discussion of that plan, see Moulton, H. G., *The Reparation Plan*. (Investigations in International Economic Reconstruction, Institute of Economics, Washington.)

Altogether, its powers were broad enough to permit it to regulate for over two years after the coming into force of the Treaty of Versailles—during the interim plebiscite period in Upper Silesia—the supply of coal to all the ex-belligerent countries of the Continent, except Russia. The problem of the Commission was essentially that of evaluating the fuel needs of all these countries and of establishing such a program of distribution of the coal available as would provide each country with an equal opportunity for industrial reconstruction.

Having determined the quantity and source of all the coal consumed in 1913 within the present frontiers of each country, the Commission used these figures as a basis for calculating the proportion of the available supply that each country should now receive. In practice, it was necessary to estimate as nearly as possible the quantities which were likely to be received from Great Britain and those available from Continental production outside of Germany. The balance was to be made up from Germany—from the Ruhr for France, Italy, and Belgium, and from Upper Silesia for the countries of central Europe,—provided always that Germany was left with a supply relatively as great as the other countries. However complicated the calculation of such a program may seem, it was not particularly difficult once the figures of pre-war distribution were finally arrived at.

It should be reiterated that the main concern was

to insure the physical movement of coal. The mere matter of paying for hundreds of thousands of tons of coal, even apart from the reparation deliveries, troubled the organizers of the European coal policy but little. The question of prices for the Continental output presented no serious difficulty, for in every case governmental control was such as to keep coal prices down to a relatively low level. In the case of the central European countries supplied from Upper Silesia, the exchange of other products and services for coal could be arranged without difficulty. At that time, the financial strain of the reparation deliveries upon Germany either was not realized or it was expected that German export trade would be vastly greater than subsequent events have shown.

The question of coal prices was nevertheless of profound importance. Due to government regulation in favor of British consumers, the British export prices were so high that exportations to Continental countries were restricted. Consequently, those countries, such as France and Belgium, which were largely dependent on British coal, were confronted with an enormous difference between the controlled prices of their domestic production and those of imported coal. Even under the system adopted of pooling the available supply from both domestic and foreign sources and supplying the needs of their consumers at a uniform price, they were at a disadvantage relative to those countries producing enough coal for their own needs.

As a matter of fact, Great Britain did not accept the general European coal policy as applied to her own production and consumption. The high prices which she received for export coal were utilized to reduce those paid by her own consumers, thus placing British industry in a more favorable position than that of the Continental Allies. The prices of the great bulk of the coal produced on the Continent were subject to a certain degree of international control: those of the deliveries to the Allies from the Ruhr were limited by the Treaty of Versailles; while those of the shipments from Upper Silesia to central European countries were subject to the regulation of the international governing commission, and in the last resort of the Reparation Commission.

The main lines of the general European coal policy of the Reparation Commission were being worked out in the autumn and winter of 1919 by the Allied experts. It had been expected that the Treaty of Versailles would be in force several months earlier than was actually the case, and consequently some of the calculations were upset when the final ratification was delayed until January 10, 1920.

In the meantime the shipments of coke under the Protocol of Luxemburg were being carried out, although not in quantities satisfactory to the Lorraine iron industry. In addition to this coke, the Germans began delivering as early as September, 1919, certain quantities of coal to France in anticipation of the coming into force of the Treaty. The

Central European Coal Commission was working in its unofficial and advisory capacity for the re-establishment of normal economic relations among the divisions of the old Austro-Hungarian Empire. Czechoslovakia and Poland were delivering a certain amount of coal to Austria. Although the scheme for the distribution of Upper Silesian coal was not yet functioning, the general European program was nevertheless partly in operation several months before the various treaties came into force.

The Reparation Commission had been placed in a unique position of authority and responsibility. It may as well be said here that it commenced its functions in a spirit of genuine reconstruction. Had it been allowed to continue unhampered by the Allied governments, as was the theoretical intention of the Treaty, it is hardly too much to say that Europe would not have been obliged to wait four years for a plan which would serve as the basis for a settlement of the reparation question.

CHAPTER V

THE POST-WAR FUEL EMERGENCY

The final ratification of the Treaty of Versailles did not take place until January 10, 1920, and the Reparation Commission was officially constituted only on January 13. In the meantime Europe was suffering both from an absolute shortage of fuel and from an imperfect distribution of the coal actually available for consumption. This was particularly true in France and Italy, as well as in certain countries of central Europe. The coal mines of Great Britain were not producing a surplus over domestic needs sufficient to supply the shortage on the Continent, and there was not available enough shipping to permit additional imports from the United States. Moreover, the prices of imported coal were so high that financial considerations, which had been left largely out of account during the war, made it imperative that imports to the Continent be reduced to a minimum.

It was therefore of the utmost importance that the coal program of the Peace Conference and the Reparation Commission should be put into operation at the earliest possible moment. The necessity

of immediate action had been realized, of course, for several months by the organizers of the Reparation Commission. It was even to a certain extent admitted by the German Government, which had voluntarily consented to commence coal deliveries on September 1, 1919, in anticipation of the coming into force of the Treaty, although the quantities actually furnished were far short of the Allied requirements. When the Reparation Commission came to the practical administration of the coal program, however, numerous difficulties were encountered—partly because of misunderstandings with the German Government, and partly because of the conflict inherent in the task of collecting immediate reparation payments and at the same time promoting the general economic reconstruction of Europe.

The present chapter deals primarily with the coal and coke deliveries demanded and received from Germany during the period of the fuel emergency, while the chapter which follows deals with the problem of reparation deliveries under conditions which were somewhat less abnormal. While the discussion in these two chapters is necessarily historical, the purpose is not merely to record events; it is to indicate the developments that gradually led to the emergence of the conflict between the two principles of national reparation and of international economic reconstruction and to analyze some of the more important results of that conflict.

I. AN UNSATISFACTORY BEGINNING

When the newly constituted Reparation Commission came to take stock of the status of reparation coal deliveries at the beginning of the year 1920, it was confronted with a situation of extreme complexity, not to say ambiguity. Germany was delivering something like half a million tons of coal and coke per month and declaring upon every possible occasion that she could furnish no more without seriously impairing the fuel supply of her own industries. Meanwhile she had agreed in a protocol dated August 29, 1919,¹ to furnish the Allies as soon as the Treaty came into operation with a minimum of 1,660,000 tons per month, plus a certain proportion of her excess of production over 108,000,000 tons annually. On the other hand, certain of the Allies were demanding that Germany deliver the maximum quantities of coal and coke specified in the options accorded by the Treaty, which would have amounted to some 3,500,000 tons monthly. The situation was further complicated by the fact that the legal status of Germany's actual obligation to deliver coal was ambiguous.

¹ This agreement was concluded between the organization committee of the Reparation Commission and the German Government. It was drawn up in the form of a resolution to be adopted immediately upon the official setting up of the Commission. Germany agreed, however, to commence deliveries on Sept. 1, 1919, although no specific provision was made as to the quantities to be furnished in anticipation of the Treaty. See *Report on the Work of the Reparation Commission, 1920-22*, Vol. V, p. 94, H. M. Stationery Office, London.

Confusion and bad feeling resulted from the early administration of coal deliveries. On August 31, 1919 (two days after the signature of the Protocol of August 29), the organization Committee of the Reparation Commission had made a formal demand upon Germany² for the delivery during the month of January, 1920, of approximately 3,200,000 tons of coal. This had been done in an attempt to comply with the provision for 120 days' notice in paragraph 10 of the coal clauses of the Treaty. The German Government, however, had refused to recognize the demand as binding, on the ground that, since the Treaty was not yet in force and the Reparation Commission did not exist, it could have no legal significance.

When the Commission was officially constituted and the deliberations on coal were commenced, the French delegate insisted that the demand made on August 31, 1919, was legally binding. Consequently, there were in existence two conflicting programs. The Protocol of August 29, under the sliding scale of its proposed resolution, provided for the delivery of approximately 2,200,000 tons, while the formal demand of August 31 was for about 3,200,000 tons.

The situation was further complicated by the fact that if a formal demand were made now it could be effective only 120 days hence, while the need for continued coal shipments during the winter months

²See *Report on the Work of the Reparation Commission*, Vol. V, p. 94.

was urgent. Finally, after much discussion among the Allied representatives, the Germans were notified, on January 31, of the formal ratification by the Reparation Commission of the Protocol of August 29 and invited to increase their deliveries of coal to meet the requirements of the sliding scale referred to. They replied that they were under no legal obligation to make any deliveries until the expiration of the notice of 120 days stipulated in the Treaty, but that as a matter of good will they would go on making shipments in as large quantities as their own industrial requirements would permit.

All through the early discussions of coal deliveries under the Treaty this question of 120 days' notice was present like a skeleton at a feast. In the hope of getting rid of it once and for all, the advice of the Legal Service of the Reparation Commission was asked. The reply was that the Protocol of August 29 was in effect a mutual agreement to dispense with the 120-day clause of the coal Annex of the Treaty. The Germans refused to admit this interpretation, however, and the Commission, as distinct from its Legal Service, did not make a formal decision in the matter. After the Conference of Spa in July, 1920, however, the whole matter was dropped. The Germans tacitly admitted that no such notice was necessary and that the question was irrelevant to the larger issues involved, but not before they had attempted to utilize it as an argument against a declaration of a default on coal deliveries.

Finally the Reparation Commission sought a practical agreement with the German Government. Under the provisions of paragraph 9 of Annex II of the reparation clauses of the Treaty, which stipulates that Germany shall be given an opportunity to be heard before any important demands are imposed upon her, the Commission invited the German Government to send representatives to discuss the practical problems involved in coal deliveries. Germany accepted the invitation, and the first meeting took place in February, 1920.

The Allied experts had previously prepared a number of comprehensive tables, showing the coal available for consumption in each of the Allied countries and in Germany, and the coefficient of satisfaction which this constituted of the 1913 needs of each country involved. These tabulations showed also what would be the coefficient of satisfaction of each country in case Germany delivered certain specified quantities to France, Italy and Belgium. A number of hypothetical cases were taken, based on amounts to be delivered by Germany varying from 1,660,000 tons monthly—the minimum figure of the Protocol of August 29—to 3,500,000 tons—the maximum options provided by the Treaty. It was thus possible to present the general scheme of European coal distribution in mathematical terms.

When these computations were introduced into the discussion the German representatives refused to accept either the principle involved or the fair-

ness of the figures presented by the Allied experts. Their chief objection was that Germany's coal requirements had considerably increased in proportion to her consumption in 1913, due to lowered industrial efficiency, to the fuel requirements of new fertilizer plants, and above all, to the need of more coal in order to increase the production of exportable goods required to permit reparation payments. The importance of the last argument was recognized, but for the time being the fuel shortage was so urgent that the wider reparation program had to be left largely out of account. At last, after the negotiations had been prolonged for more than a month, a program was tentatively agreed upon for the month of April, calling for the delivery of 1,440,000 tons, the Germans promising to do what they could to execute it. They declared their readiness to forego for this one month their right under the Treaty to receive a notice of 120 days.

Negotiations were broken off at the end of March, 1920, without any general agreement being reached. They were not resumed for several months. At the end of April the Reparation Commission formally notified Germany that she would be expected to deliver 1,925,000 tons of coal in May, 2,062,000 tons in June and 2,175,000 tons in July, these figures being calculated on the basis of the sliding scale included in the Protocol of August 29.³ German production had materially increased over the 108

³ *Report on the Work of the Reparation Commission*, Vol. V.

million tons annually, referred to in the Protocol, and the Reparation Commission, in the absence of any common agreement, made an estimate of the probable production for the months in question and formulated its coal demands accordingly.

The early execution of the coal clauses of the Treaty of Versailles was highly unsatisfactory to the Allies. Although the actual shipments of coal and coke were being slowly increased from month to month they were far short of the urgent needs of the Allied countries. The deliveries for the first three months of the year 1920 amounted to only 536,000 tons in January, 656,000 tons in February and 688,000 tons in March. In April the quantity was increased to only 744,000 tons, which was wholly insufficient to satisfy the very much reduced demand of the Reparation Commission for 1,440,000 tons.⁴

All this added to the growing impatience in France and in other Allied countries with the manner in which Germany was commencing the execution of the Treaty. It was perhaps natural that the German point of view was little heeded and that various technical questions involved were deemed unworthy of consideration. In France, one all-important fact overshadowed everything else: Germany was delivering hardly half the coal necessary to replace the

⁴All figures for coal deliveries on the reparation account taken from official records of the Reparation Commission, used by the author with the express permission of the General Secretary. Coke is calculated in terms of coal at the rate of three tons of coke to four tons of coal.

loss of output from the mines devastated by the German armies.⁵

A rather substantial increase in shipments was realized in May, the deliveries amounting for that month to 1,123,000 tons, but this was still short of the Allied demands. Moreover, when the Reparation Commission increased the allotment of Upper Silesian coal to Poland from 350,000 to 450,000 tons per month, Germany protested that since she was being deprived of her legitimate fuel supply from her eastern mining districts she would not be able to fulfill the demands of the Allies from the west. The increase in shipments was abruptly stopped at the beginning of June, and the deliveries for the month amounted to only 1,088,000 tons as compared with 1,123,000 tons in May.

Germany was declared in default on coal deliveries before the Treaty of Versailles had been in operation six months. France was in urgent need of additional coal for her general fuel needs and of coke for her iron and steel industry. With the aid of the coke included in the reparation deliveries the iron industry in Lorraine had been slowly recovering its productive capacity. In possession since the war of the blast furnaces of the whole Lorraine district, France was in a position to become one of the great iron producing countries of the world. The Lorraine iron mas-

⁵The loss of output from the devastated mines amounted in January, 1920, to 1,392,510 tons. By the end of the year it had been reduced to 1,195,000 tons and by the end of 1921 to 940,000 tons. Since that time the mines have been gradually restored.

ters were dependent almost exclusively upon Ruhr coke; and the increase in shipments during the first five months of the year, while not meeting their needs entirely, gave reason to hope for a considerable development in the future. The amount of coke delivered—almost exclusively to Lorraine, since the need of the rest of the country was primarily for coal—was limited by the quantity available after the indispensable requirements for coal had been met.

When the shipments fell off in June, therefore, the blow to the metallurgical industry in Lorraine was particularly severe. Public opinion in France demanded extreme measures. The French government requested the Reparation Commission to declare Germany in default on coal deliveries, under the provisions of paragraph 17 of Annex II of the reparation clauses of the Treaty. This was a reversal of the procedure theoretically established by the Treaty, the intent of which was that the Commission itself should take the initiative. Thus there was established a practice which made the Reparation Commission merely an organ of the Allied governments and which nullified the judicial and deliberative powers which had been imputed to it as an independent tribunal.

Before making a decision of such grave import, however, the Commission gave the German Government an opportunity to show cause why a default should not be declared. The argument presented

by the German representatives was substantially as follows: the quantities of coal being shipped were actually greater than the supply available in Germany would permit; this had been especially true after the shipments from Upper Silesia to Poland were increased. The recovery of German economic life necessary to permit the execution of the general reparation demands of the Treaty depended in a large measure upon the coal supply, which was inadequate even though no reparation deliveries had been required. Finally, it was contended that Germany could not possibly be in default on coal deliveries, since according to the Treaty a notice of 120 days was required for all shipments after January 1, 1920. The first legal notice had been given on January 31, which would make the first Treaty deliveries due on May 31. Owing to the fact that with the shipments voluntarily made before the Treaty came into force something like 6 million tons had already been delivered before the latter date, Germany was under no obligation to make any further deliveries for several months.

While the first contentions of the German representatives were given consideration, the argument concerning the legal notice required for deliveries was dismissed as being merely a pretext to avoid the issue. Moreover, the difference between the coal actually furnished by Germany and the demands of the Allies was so great that the Commission felt entirely justified in declaring a default. The need

for coal in the Allied countries was still in the nature of an emergency, quite apart from the larger economic and financial problems involved, and Germany was unquestionably better supplied than France, Italy or Belgium.⁶ Consequently, the Allied governments were formally notified on June 30, 1920,⁷ that Germany had failed to meet her obligations under the Treaty of Versailles with respect to coal deliveries.

II. THE CONFERENCE OF SPA AND THE PROTOCOL OF JULY, 1920

During the early months of the execution of the Treaty of Versailles the whole reparation question was in the clutch of circumstances over which the Reparation Commission had no effective control. Under the influence of war psychology in the Allied countries the most fantastic expectations had been indulged—expectations which bore no relation to the capacity of Germany to make reparation payments. On the German side there seemed to be a feeling that every possible measure should be taken to prove that little or nothing could be paid or delivered. The whole problem was complicated by the fact that no thoroughgoing discussion of fundamentals had ever been attempted by the responsible statesmen of the opposing countries.

In response to the manifest need of such a frank,

⁶ See table on p. 141.

⁷ *Report on the Work of the Reparation Commission*, Vol. V, p. 98.

businesslike consideration of the tremendous issues involved, the British Prime Minister, in the spring of 1920, had proposed a conference of the heads of the German and Allied governments. The Allied Prime Ministers, commonly designated as the Supreme Council, met at San Remo (April 19-26, 1920) for the purpose of discussing the reparation question and the problems arising out of the execution of the Treaty. At this meeting it was decided for the first time to have the Supreme Council meet the German Government face to face "for the discussion of the practical application of the reparation clauses."

Before this conference was assembled, however, the Supreme Council had met on two occasions, once at Hythe (England) in May and once at Boulogne (France) in June, only to postpone the meeting with the Germans. Finally, it was decided to open the Conference on July 5, at Spa, in Belgium. In the meantime, on June 30, the declaration of Germany's default on coal deliveries had been made by the Reparation Commission. Consequently, when the Allied ministers met at Brussels on July 2-3 to draw up concerted proposals to present to the Germans at Spa, the need for coal was so urgent as to overshadow the officially announced purpose of the conference. Since the chief need was to procure coal, there was very little to be decided at Brussels, and the discussion was devoted mainly to an attempt to devise some effective method of obtaining a substantial increase in deliveries. No definite program was

adopted, however, and the conference of Spa was opened on July 5, 1920, without any preliminary agreement among the Allied ministers.

At Spa the conflict between immediate national reparation and general international restoration became apparent. It was during this conference and the inter-Allied discussions at Brussels which preceded it that there began to be evident a fundamental difference of opinion between the statesmen of France and Great Britain. The two Governments, while openly declaring their perfect accord on the question of principle,—namely, that of procuring reparation in general and coal in particular,—differed widely as to methods. In spite of the reassuring messages given out to the press it was manifest that, even at this early stage in the execution of the Treaty of Versailles, the British and French statesmen were approaching the reparation question from different and opposing points of view. Already the British, due perhaps to the peculiar economic position of their country which forced upon them a clearer understanding of the problems of world trade and of the economic inter-dependence of nations, were beginning to direct their efforts towards a program of general European reconstruction.

The French, on the other hand, while recognizing the exigencies of the larger program, were faced with economic and financial problems of such immediate urgency that they considered it impossible to proceed with a comprehensive scheme of European re-

construction until what they looked upon as an emergency had been met and adequately dealt with. The British also recognized the emergency, particularly with respect to the need for coal deliveries, but they insisted upon considering this in connection with the larger problem.

As the first meeting of the heads of the Allied and German Governments, the Conference of Spa gave promise of being an occasion of considerable moment in the international relations of Europe. It marked an attempted departure in the methods employed since the termination of hostilities for the settlement of the problems arising out of the war. For the first time the Allied statesmen were to meet those of Germany around a common conference table in an effort—however futile—to negotiate rather than force a settlement of some of the great issues of post-war Europe.

But the fundamentals of the reparation question were hardly discussed at all with the Germans. The Conference of Spa was in reality a double series of conferences: those among the Allied statesmen and their respective staffs of experts; and those between the Allies and the Germans. The former were devoted largely to continuing the discussions started a few days previously at Brussels, in an endeavor to present a united front before the Germans. They were confined for the most part to discussions of coal deliveries and disarmament. Germany had previously made a tentative proposal on the general

reparation question, but this was so far short of Allied expectations that it was deemed inexpedient to attempt any discussion of fundamentals, the more so, since the Allied statesmen were not in agreement among themselves.

The financial aspects of coal deliveries were for the first time given serious consideration. The German representatives at the Spa conference called attention to the enormous difference between the internal price of coal, which was absurdly low due to the depreciation of the mark, and the price in vogue in the world market, which on a gold basis was four or five times higher. They dwelt at length on the financial difficulties of the government in paying for imports of food, which were indispensable for any increase in coal output in Germany. If a part of the coal shipped to the Allies might be exported as an ordinary commercial transaction at world market prices, the proceeds would be of immense assistance in the general economic recovery of the country, thus adding to the possibility of reparation payments in the future. In particular, they pointed out that the funds made available by coal exports might be used to purchase food for the miners who were then admittedly undernourished, and thus directly to increase the output. The implication of this argument was that even the deliveries being made at that time, which amounted to roughly a million tons per month, should be reduced.

In view of the urgent need of additional fuel in

France, Italy and Belgium, the Allied statesmen were unable to entertain any proposal which did not promise an increase rather than a decrease in reparation deliveries. They were, in fact, in substantial agreement that Germany must furnish something like twice as much coal as she was then delivering. The German argument, however, was sufficiently serious to necessitate a conference of the Allied statesmen among themselves. The British ministers urged that some sort of compensation be made to Germany for the extremely low price at which reparation coal was being delivered, while the French representatives were inclined to insist upon the full rights granted them by the Treaty of Versailles.

The British and French statesmen were not able to reach an agreement on the question of principle with respect to coal prices. It was finally decided, however, that certain temporary financial concessions should be made to Germany in order to make possible an increase in coal production. In the meantime, the meetings with the Germans had been largely devoted to argument over the quantity of coal to be delivered, the Allies at last demanding as an absolute minimum the delivery of 2,200,000 tons monthly. The Germans had gradually increased their offers from less than 1,000,000 tons, to 1,800,000 tons, protesting the while that the delivery of any such quantity would ruin them.

At this stage the British ministers assumed the rôle of conciliators, with the result that the Allied

statesmen set forth in the form of a Protocol the ultimate irreducible minimum of their demands, which was for the delivery of 12,000,000 tons of coal during the six months commencing August 1, 1920. The Protocol was handed to the German government with *an ultimatum*, stipulating in the last paragraph that "if, by November 15, 1920, it is ascertained that the total deliveries for August, September, and October, 1920 have not reached 6 million tons, *the Allies will proceed to the occupation of a further portion of German territory, either the region of the Ruhr or some other.*" The German ministers signed the agreement, making reservations, of course, as to the last paragraph.

The financial concessions incorporated in the Protocol of Spa were of considerable significance. They represented the first official recognition on the part of the Allied ministers of the existence of a financial problem in connection with reparation payments in kind. The nature of the problem involved will be discussed in some detail in a later chapter.⁸ Here it will suffice to observe that from the point of view of the German budget there was no essential difference between payments in kind and payments in cash, the government being obliged to pay for the goods delivered. The effect on the international financial position of Germany, however, was not the same, since no operation in foreign exchange was involved in delivering coal. Nevertheless, Germany's

⁸ See Chapter VI, p. 166.

foreign exchange was indirectly affected in so far as she delivered goods to the Allies without payment which she might otherwise have exported under ordinary commercial conditions.

Briefly stated, the financial concessions made at Spa were as follows: ⁹ (a) As a premium granted "in consideration of the admission of the right of the Allies to have coal of specified kind and quality delivered to them," the receiving countries agreed to pay to Germany five gold marks in cash for every ton delivered, with the understanding that the money involved was to "be applied to the acquisition of food-stuffs for the German miners." This premium of five gold marks was to be paid outright and did not represent a loan.

(b) Under the terms of articles 235 and 251 of the Treaty of Versailles, which provide for securing adequate supplies of food-stuffs and raw materials for Germany, the Allies agreed to make loans equal in amount to the difference between the internal price of German coal and the export price f. o. b. either German or British seaports, for all coal delivered by rail or inland waterway. The repayment of these loans was to be made in priority over all the sums due by Germany on the reparation account.

For all practical purposes the money involved in this transaction was equivalent to the payment at rather high prices for the greater part of the coal

⁹ *Report on the Work of the Reparation Commission, Vol. V, p. 99.*

delivered, since it was doubtful if in the long run the total payments to the Allies would be affected by the bookkeeping operation involved in charging off the first payments in cash or kind against the loans advanced for coal deliveries. The payment was at a rather high price for the reason that the difference between the German internal price and the British export price (no German export price existed at the time) amounted to approximately 40 gold marks per ton.¹⁰ This, plus the premium of five gold marks, brought the price up to 45 gold marks or nearly \$11 per ton. Although the British export price was higher, it may very well be that had there been offered in competition with British coal in the European market quantities comparable with the reparation deliveries the British export price would have fallen. Consequently, it is possible that Germany actually received in cash, for the coal delivered under the provisions of the Protocol of Spa, as much as she would have realized from the export of the same coal as an ordinary commercial transaction.¹¹

In general, the terms of the Protocol of Spa were carried out in their entirety. The cash advances made against coal deliveries by rail and inland water amounted, during the six months covered by the agreement, to approximately 361 million gold

¹⁰ *Ibid.*

¹¹ The other results of the Conference of Spa were: (1) a promise on the part of Germany to complete the disarmament clauses of the Treaty of Versailles and (2) an agreement of the Allied ministers on the proportional distribution among their respective countries of the total reparation claims upon Germany.

marks.¹² Together with the premium of five gold marks per ton paid outright by the receiving countries, Germany actually realized in foreign money sums amounting to over 400 million gold marks, or nearly 100 million dollars. This meant that Germany's ability to pay for her necessary imports of food and raw material was increased by this considerable sum. The effects on her international financial position extended well into the year 1921, and there can be little doubt that the sums thus received were partly instrumental in sustaining the foreign exchange value of the paper mark, which was in the aggregate slightly raised during the period from September, 1920 to June, 1921.

The coal actually received by the Allies during the period covered by the Protocol amounted to approximately 11,000,000 tons.¹³ But the quantity shipped was somewhat more, being sufficiently near to the 12,000,000 tons stipulated in the agreement to satisfy the Reparation Commission. During the latter part of July, 1920, the shipments had been materially increased, and the quantities received by the Allies amounted for the month to about 1,350,000 tons, as compared with less than 1,088,000 tons in June. The quantity received in August was approximately 1,900,000 tons¹⁴ thus showing a marked increase over June and July.

¹² *Report on the Work of the Reparation Commission*, Vol. V, p. 100.

¹³ *Official Records of the Reparation Commission*.

¹⁴ *Ibid.*

It is perhaps natural that there was in France a tendency to believe that this marked increase in deliveries was only another proof that the German protests of inability to execute the reparation clauses of the Treaty were insincere, and that Germany understood only the language of force, as exemplified in the last paragraph of the Spa Protocol. In Germany, on the other hand, it was believed with equal conviction that the delivery of such quantities of coal was crippling the economic life of the country and thereby diminishing the possibility of carrying out the larger reparation program.

III. THE PASSING OF THE FUEL EMERGENCY

The tangible results of the first year of the execution of the coal clauses of the Treaty of Versailles may be summarized as follows: during the period extending from September 1, 1919 to January 31, 1921, the quantities actually received from Germany amounted to 19,500,000 tons. The demands of the Reparation Commission, according to its own method of calculating the programs for the first seven months of the year 1920, amounted to approximately 26,000,000 tons.¹⁵ On the basis of these figures the demands of the Commission were met only to the extent of 75 per cent. The German claim, on the contrary, was that the programs legally

¹⁵ *Report on the Work of the Reparation Commission*, Vol. V, p. 229.

drawn up and transmitted had been more than executed.

In considering the respective merits of the main contentions of the Allies and of Germany, the matter of the strict legality of the early demands of the Reparation Commission is of academic interest only. A question which is of somewhat more importance is whether Germany was doing as much to execute the coal clauses of the Treaty as could reasonably have been required of her under all the attending circumstances.

The answer to this question will depend very largely upon what is considered to have been the chief duty of the Reparation Commission during this period. If that duty was primarily to provide for the Continental Allies sufficient coal to permit them to operate their industries on a scale relatively equivalent to that of the industries in Germany, then Germany could and should have furnished considerably more coal than she did. If, on the other hand, the chief duty of the Commission was to ensure that Germany should be left with sufficient coal to permit her to recover her productive capacity, with a view to meeting her reparation obligations as promptly and as completely as possible, then the answer to the question becomes less certain and much more complex.

In the early months of 1920 the need of the Allies for coal was properly a first consideration of the Reparation Commission. An emergency existed, due

to the intense coal shortage on the Continent, and the Continental Allies were much more seriously affected than Germany. The chief duty of the Commission at that time was to obtain as far as lay within its power a more even distribution of the coal available. Unquestionably Germany was better supplied throughout the year 1920, notwithstanding the reparation deliveries, than the Continental Allies. The following table, compiled from figures published in a report of the German National Coal Association,¹⁶ will show the total coal available for consumption in 1913 and in 1920, in Germany and the principal Allied countries.

THOUSANDS OF METRIC TONS

(Lignite in terms of coal at ratio of 9 to 2; coke imports and exports calculated in terms of coal.)

Countries (Frontiers of 1920)	Consumed in 1913 ^a			Consumed in 1920			Per- cent- age of 1913 Con- sump- tion
	Coal	Lig- nite	Total in Coal Value	Coal	Lig- nite	Total in Coal Value	
Germany ^b	132,000	92,000	152,000	109,000	110,000	134,000	88
France ^c	72,500	.....	72,500	55,000	1,000	55,000	76
Italy	11,000	.....	11,000	6,000	2,000	6,000	55
Belgium	27,000	.....	27,000	22,000	.....	22,000	81
United Kingdom	214,000	.....	214,000	203,000	.....	203,000	95

^a 1913 consumption of Germany and France calculated by subtracting or adding the consumption of the territory lost or gained. See footnote to tables on pp. 69 and 70, Chapter III.

^b Excluding the Saar.

^c Including Alsace-Lorraine, but not the Saar.

¹⁶ *Jahresbericht der Aktiengesellschaft Reichskohlenverband für das Geschäftsjahr, 1923-24.*

It is therefore safe to assert that Germany could and should have delivered more coal in the early months of the year 1920. She was furnishing on the reparation account little more than one-fourth¹⁷ of the quantities later delivered under the Protocol of Spa. Although her own production¹⁸ was somewhat less during the early months than in the latter half of the year, the difference was not sufficient to justify the small quantities delivered to the Allies. It is true that the first demands of the Allies were grossly exaggerated. The program transmitted to Germany on August 31, 1919, calling for the delivery of over 3,000,000 tons in January, 1920, was in fact unreasonable. Even though such a quantity of coal could have been furnished without serious injury to German industry, which was certainly not the case, it was at that time physically impossible to handle any such volume of coal shipments, for sheer lack of transportation facilities. The conclusion seems nevertheless justifiable, that while the demands of the Allies were exaggerated, the deliveries of Germany were far short of what might have been done to remedy the existing emergency.

In the latter half of 1920 the situation was substantially altered. The emergency was passing, due largely to the fact that the effects of the world-wide

¹⁷ For quantities delivered, see p. 125 above.

¹⁸ Germany's production of coal—not including lignite—by quarters in 1920 was as follows: January to March, 30,703,000 tons; April to June 31,267,000 tons; July to September 33,847,000 tons; October to December 35,610,000 tons. *Gluckauf-Jahrgang* 56 ũ 57, 1921 and 1922.

business depression began to be felt in Europe and the coal supply became more adequate on account of reduced industrial demand. Moreover, after the settlement of the great strike of the British miners in October, 1920, the production of coal in Great Britain increased rapidly, prices were lowered, and a greater surplus became available for exportation than at any time since the war.

With the passing of the fuel emergency the general requirements for European reconstruction should have assumed paramount importance. This was true as a long-run proposition, even for the collection of the maximum of reparation payments, particularly at that time, because of the exceptional economic situation existing in Germany. Due to the depreciation of the paper mark, the relatively low price and wage level, and to the efforts of Germany to re-establish her position in world trade, the general business depression of the period affected her less than the other industrial nations. Under such conditions it was of the utmost importance that Germany be enabled to develop the manufacturing and export capacity necessary to permit her to meet the reparation payments which were to be demanded of her in the following years. Coal, of course, was not the only factor involved in this—the ability to find markets was certainly of equal importance,—but coal represented the motive force.

Neither the long-run requirements for maximum reparation payments nor the more general needs of

European reconstruction received adequate consideration in the formulation of the subsequent demands upon Germany for coal deliveries. The conflict between the two opposing principles—of immediate payments, on the one hand, and of the economic reconstruction of Germany in the interest of a general recovery in Europe and larger payments in the long-run, on the other,—was in fact accentuated after the passing of the fuel emergency. The manner in which this conflict reacted, first, upon the re-establishment of normal productive activity in the disrupted Ruhr-Lorraine system, and secondly, upon the general economic and financial situation in Germany and in Europe as a whole, will furnish the main theme of our next chapter.

CHAPTER VI.

THE COAL PROBLEM IN 1921 AND 1922

The second period of reparation coal deliveries extended from February 1, 1921 to January 11, 1923, the date of the invasion of the Ruhr. It has been shown in the preceding chapters that until near the end of the year 1920 the question of coal in the general sense of fuel was a primary preoccupation of European statesmen; that the two years immediately following the Armistice constituted a period of readjustment in the distribution of basic raw materials; and finally, that reparation coal deliveries were organized upon the general theory of obtaining an equitable distribution of the coal available for European consumption.

In contrast with the years 1919 and 1920, the second period was marked by a relatively plentiful supply of fuel in the aggregate; the demands of industry were now being viewed more as a matter of business than as a national emergency. Passions were cooling, and normal business as such was striving to resume control of the European economic machine. Consequently, certain aspects of reparation coal deliveries which had received scant attention during the emergency period were now be-

coming of predominant importance. These were chiefly, (1) the need of the Lorraine iron industry for an assured supply of coke, and (2) the financial consequences of coal deliveries. It is true that the need of the French iron industry for coke had been urgent all along, but now that the general fuel emergency was passing the matter of an adequate coke supply remained so important as to demand special consideration.

Early in the year 1921, moreover, the London schedule of payments was imposed upon Germany with a virtual ultimatum calling for the annual payment to the Allies of enormous sums of money, thus creating for the German Government the double problem of meeting a huge increase in its budgetary expenditures and of procuring by means of exports the foreign balances required for reparation payments in a form acceptable to the Allies. Under such conditions the financial consequences of coal deliveries assumed a degree of importance that had not been apparent before.

The present chapter, in addition to outlining the main facts of the situation in the years 1921 and 1922, will be devoted especially to discussion and analysis of the coke supply of Lorraine and the financial aspects of coal deliveries.

I. DEMANDS AND DELIVERIES

In the midst of the deliveries under the Protocol of Spa, in November, 1920, negotiations were com-

menced with the German experts in an attempt to agree upon a program for the months following February 1, 1921. The result was a repetition of the previous discussions and arguments, without any agreement being reached. In the subsequent deliberations of the Reparation Commission, the French, Belgian, and Italian governments insisted that deliveries be increased beyond the quantities stipulated by the Protocol of Spa. Even though the intense shortage in Europe was passing, those countries were still importers of coal, and it was obviously more advantageous to receive reparation deliveries from Germany without payment than to satisfy their fuel requirements by imports from Great Britain and other coal exporting countries. It was merely a matter of business.

On the general question of coal deliveries the fundamental disagreement between Great Britain and the Continental Allies was accentuated. In France, especially, the public clamor for coal from Germany had become a sort of national habit, associated in the popular feeling of the country with a demand for justice for the devastation of the French mines. Moreover, the coal received on the reparation account was real and tangible, so that the French people could feel that at least something was being paid by Germany. Even though the press and the politicians had wished, it would have been exceedingly difficult to make the public understand the intimate relationship between the question of

coal deliveries and the larger problem of reparation payments in general.

Great Britain, on the other hand, insisted more upon the general reparation program and less upon immediate deliveries. The very nature of the geographical and economic position of England, which renders her more dependent than any other country on the normal functioning of international trade, made it practically impossible for her to separate her own interests from the interests of Europe as a whole. Consequently, when the British Delegate to the Reparation Commission urged that the demands for coal be reduced in the interest of general economic reconstruction and of permitting Germany to recover the industrial capacity necessary eventually to meet her reparation obligations he was accused in France of wishing merely to promote the British coal trade. The accusation, moreover, was impossible to disprove, for the reason that every ton of reparation coal received from Germany relieved France from the necessity of purchasing a ton of British coal.¹

The question of coal prices also was a source of misunderstanding between France and Great

¹ Much has been made in the German press of the re-exportation by France of some of the coal received on the reparation account. As a matter of fact, the quantities involved were insignificant; France was a large net importer of coal over and above the quantities received on the reparation account. Her exports, moreover, went largely to her allies, Italy and Belgium, and represented in their entirety less than her imports from the latter country. The actual figures for the years 1920, 1921, and

Britain. Ever since the end of the war the British exporters had been striving to rebuild and to protect their Continental coal trade. Moreover, they had been, until near the end of the year 1920, demanding and receiving, with the full co-operation of the British government, a price of something like 100 shillings per ton for ordinary mine-run coal, f.o.b. Cardiff and other British ports, while the price at the mines to consumers in Great Britain was usually less than 35s.²

When Great Britain urged that an equitable price be allowed to Germany for the reparation deliveries there was a tendency in France to feel that this proposal was flagrantly unfair. The French feeling, frankly expressed—as of course was never the case among responsible ministers—was about as follows: England is profiteering at our expense and using the proceeds to subsidize her own industries, particularly the metallurgical industry, to compete with an

1922, taken from the German *Jahresbericht Reichskohlenverband*, 1923-24, were as follows:

THOUSANDS OF METRIC TONS, COKE CALCULATED IN TERMS OF COAL.

Year	Imports		Exports Totals
	Total (Exclud- ing Reparation Deliveries)	Of Which from Belgium	
1921.....	21,728	1,460	475
1920.....	12,970	2,290	2,406
1922.....	20,652	3,825	2,858

² See quotations in the *Colliery Guardian* of the period.

enormous advantage against ours. Not satisfied with this, England now wants to nullify what little incidental advantage the Treaty affords us on the coal and coke received on the reparation account; and this in favor of our common enemy of yesterday. Verily Albion is as perfidious as ever. . . .

It might very well be argued, of course, that Great Britain, as one of the Allies, was as much entitled to work for her own interests as France. Nevertheless the dispute over coal prices served to increase the difficulties of co-operation between these two principal Allies in working out a solution of the reparation problem. In formulating the demands of the Reparation Commission for the deliveries to be made after the expiration of the Protocol of Spa, the British Delegate finally agreed to a figure of 2,200,000 tons per month, although he did not fail to point out the danger to the general reparation program of depriving Germany of too much coal. The cleavage between the points of view of Great Britain and the Continental Allies, however, was clear-cut and fundamental.

The increased demands of the Reparation Commission followed an alleviation of the coal shortage. By the beginning of February, 1921, when the new program requiring Germany to deliver 2,200,000 tons per month came into effect, the coal market of Europe began to reach the saturation point. In the larger sense, at least, it was no longer necessary to solicit governments for the privilege of buying coal

from their export agencies; on the contrary, those agencies began to display an increasing anxiety to find markets for their products. In contrast with the years 1919 and 1920 there now began a search on the part of sellers for buyers, rather than of buyers for sellers.

But the situation in Germany, as pointed out in the preceding chapter,³ was exceptional, due to the fact that German industry suffered relatively little from the general business depression of 1920 and 1921. Germany was still in need of additional coal,⁴ for even without deliveries on the reparation account, she would have had available somewhat less fuel than before the war, although relatively more than the Continental Allies. Consequently she had every incentive, quite apart from the financial burden involved, to reduce deliveries as far as the Reparation Commission and the Allied Governments would permit.

France, Italy, and Belgium, however, were in a somewhat similar position with respect to coal requirements. While more seriously affected by the business depression than Germany, they had nevertheless the advantage of currencies of lower exchange value than those of Great Britain and the United States. Favored by internal price and wage levels lower than their great competitors, they too were

³ P. 143, Chap. V.

⁴ The best proof of this statement lies in the fact that Germany began to import coal in 1921. See Section III of this chapter on the financial aspects of coal deliveries.

endeavoring to recover their former position in world trade. In particular, the French metallurgical industry in Lorraine required coke from the Ruhr, and in this case it was practically impossible to supply the need from any other source. It should be remembered, therefore, that while the demands of the Allies for the delivery of large quantities of German coal and coke were hardly compatible with the broader reparation program, they were nevertheless inspired, at least in part, by a genuine need of additional fuel.

The full demands of the Reparation Commission in 1921 were not insisted upon. The formal programs transmitted to Germany called for the delivery of 2,200,000 tons per month throughout the year, but this figure was never attained by the actual shipments. Even in January, 1921, the last month of the execution of the Protocol of Spa, the deliveries had fallen to about 1,600,000 tons in the face of a demand of 2,000,000 tons. The shipments continued for several months at a rate even lower, the average receipts of the Allies being 1,565,000 tons for the four months, February to May.⁵ The demand for an increase in deliveries was actually met by a decrease. However, there is good reason to believe that as far as coal was concerned, as distinct from coke, France, at least, was receiving as much reparation fuel as she could absorb; and consequently the protests of the Reparation Commission

⁵ Official records of the Reparation Commission.

on account of the decrease in shipments were largely a matter of form.

In order to understand why France was receiving about as much reparation coal as she could dispose of, when she was at the same time importing large quantities from Great Britain, it is necessary to recall that at the end of the year 1920 the governmental control of coal distribution was discontinued in both Great Britain and France, and that French consumers were left free to purchase their fuel wherever they wished. The method of procedure of the government in disposing of reparation coal was briefly as follows:—

A corporation (l'Office des Houillères Sinistrées), created for the purpose by the Ministry of Public Works, received the German coal and sold it, either directly to the large consumers such as railways, metallurgical concerns, and the like, or to large wholesale dealers. So long as imports were controlled by the government and an average price was fixed for all the fuel available, the disposal of the reparation coal was a simple matter: it was merely allocated along with the other available fuel to whatever consumers or dealers the Minister of Public Works chose to designate. The consumers or dealers received it willingly since they were glad to get coal of any kind.⁶ When the governmental

⁶ For a description of the methods of coal administration in Europe during and after the war, see Olivier, M., *La Politique du Charbon*.

control was removed, however, the situation had changed completely.

Just when the full effects of the business depression were beginning to be felt in Europe the British mines commenced to produce a large surplus for export, and there was a sharp drop in prices.⁷ Moreover, British coal of equivalent classification was of better quality than German, partly no doubt because the British mine owners had the spur of competition to force them to exercise more care in its preparation. At any event, they energetically set about regaining and holding their coal trade in France, to such good effect that they forced the Office des Houillères Sinistrées to lower prices and to engage in a vigorous selling campaign.

The French mine owners, who had been obliged to content themselves with modest profits during the period of governmental control, were now in a worse position than ever. They had to meet the combined competition of the vendors of reparation coal and the British exporters, who were competing against each other. Throughout the year 1921, and even in 1922, though to a lesser degree, the French mines had occasionally to suspend operations for lack of markets for their output. It was currently reported in the spring and summer of 1921 that France was seriously embarrassed by a plethora of coal: the common expression was that the country was being covered up with coal. While these reports were

⁷ *Ibid.*, p. 96.

doubtless exaggerated, that there was some truth in them is evidenced by the fact that the French government did not demand any extreme measures against Germany for a shortage of nearly 30 per cent in the deliveries for the first five months of the year 1921.

Only for the delivery of coke and coking coal was there energetic insistence on the part of France. Always of very great importance, the coke requirements of Lorraine were to be hereafter a first pre-occupation of the Reparation Commission in its dealings with Germany with respect to coal deliveries. By December, 1921, the coke shipments had fallen off considerably, and the French Delegation was instructed by its government again to have Germany declared in default. Before the Reparation Commission had taken a decision, however, the German government gave notice of energetic measures taken to increase deliveries of coke. Shipments were actually hastened, and consequently the Reparation Commission contented itself with a warning admonition to Germany.⁸

The deliveries made in 1921 and 1922 were of substantial importance. During the year from February 1, 1921 to January 31, 1922, the tangible results may be summarized as follows: the quantities effectively demanded (as distinct from the nominal demand for 2,200,000 tons monthly after June) amounted to 22,100,000 tons. The deliveries amounted to

⁸ *Report on the Work of the Reparation Commission, Vol. V.*

18,100,000 tons in round numbers, or approximately 82 per cent of the demands.

Of this quantity France and Luxemburg received 12,400,000 tons, the remainder being divided about equally between Italy and Belgium.⁹ France and Luxemburg received the equivalent of about 5,500,000 tons of their portion in the form of coke. In actual coke this amounted to a little over 4,100,000 tons, practically all of which was consumed in the Lorraine region. Such was the position at the end of the second year of coal deliveries.

During the year 1922 the effective demands and deliveries were not materially different from those of 1921. The demands of the Reparation Commission amounted to 21,666,000 tons and the quantities delivered to 17,192,000 tons.¹⁰ In addition, the delivery of 950,000 tons from the Polish side of Upper Silesia was demanded after the partition of that province in June, 1922.¹¹ This latter demand remained a mere formality, however, owing to the fact that the Reparation Commission did not care to assume the responsibility of insisting upon the delivery of imported coal, although the financial consequences of a large part of the deliveries actually made was exactly the same.¹²

Several circumstances—strikes, transport difficul-

⁹ Official Records of the Reparation Commission.

¹⁰ *Ibid.*

¹¹ *Report on the Work of the Reparation Commission*, Vol. V, p. 103.

¹² See Sec. III of this chapter, p. 172, on the financial aspects of coal deliveries.

ties due to sleet and snow, refusal of coal by the Allies on account of inferior quality, and the like—combined to reduce the quantities that could be delivered and to minimize the deficit for which Germany was held responsible. Before taking up in detail the circumstances attending the deliveries in 1922, however, it will be opportune to devote a few pages to discussion of the development since the war of the Lorraine iron industry, and to consideration of the financial consequences of coal deliveries. The cause and the extent of the deficit in deliveries may better be reserved for consideration in connection with Germany's second default on coal—the default officially cited as the reason for the occupation of the Ruhr.

II. THE RUHR-LORRAINE SYSTEM AFTER THE WAR

At the time of the Armistice the productive capacity of the iron and steel plants in the Ruhr and Rhineland, in Lorraine désannexée, Luxemburg and the Saar territory, was fully as great as in 1913. In none of these regions had any material damage been inflicted by the war, and in addition the number of blast furnaces had been somewhat increased. This was not true of the iron and steel industry in French Lorraine. Most of the mines there had been occupied at the beginning of hostilities by the German armies and held throughout the war. The zone of military operations covered the greater part of the industrial districts, resulting in wholesale destruc-

tion and damage. It was estimated by the French government early in 1919 that at least 65 per cent of the blast furnaces in the region were damaged or destroyed. In the north of France the destruction was even greater, not over 30 per cent of the furnaces being left fit for use.¹³ On the other hand the metallurgical plants in central France had been considerably enlarged during the war and a number of new ones had been built.

In 1913 the pig iron output in French Lorraine amounted to 3,493,000 tons, and in northern France to 933,000 tons, making a total for the invaded regions of 4,426,000 tons. On the basis of the estimates above referred to, the combined capacity of these regions to produce pig iron in 1919 was in theory 1,502,000 tons. In 1918 the unoccupied districts of France actually produced 1,308,000 tons, and it may be assumed that the capacity was the same in 1919.

Combining these figures and adding the 1913 output of Lorraine désannexée, amounting to 3,864,000 tons, it may be estimated that in 1919 post-war France possessed sufficient blast-furnace equipment to produce 6,674,000 tons of pig iron, and that about 80 per cent of this equipment was in Lorraine. This end-of-the-war capacity was, of course, increased in the following years as the damaged furnaces were repaired or rebuilt. By the end of 1922 the plants

¹³ See Brooks and Lacroix, Bulletin 703, U. S. Geological Survey, p. 33.

were probably capable of producing as much pig iron as before the war.

The theoretical capacity of post-war Germany to produce pig iron in 1919, was at least as great as before the war. Excluding Alsace-Lorraine and the Saar, the output in 1913 amounted to 10,916,000 tons, nearly 80 per cent of which was in the Ruhr and Rhineland. These figures refer, of course, only to mechanical equipment.

In the production of iron the chief limiting factor was the supply of raw materials. These materials were iron ore in the case of Germany and coke in the case of France. While some of the iron mines in French Lorraine had been slightly damaged, the capacity of the entire Lorraine region to produce ore, as far as material equipment was concerned, was practically as great as before the war. The chief problem of the mining industry was to dispose of the ore that would normally be produced by the efficient operation of the mines. It may be safely asserted, therefore, that the resumption of pig iron production in France, on a scale commensurate with the blast furnace equipment available, was limited chiefly by the quantities of coke that could be procured.

Germany, on the other hand, was relatively well supplied with coke, but her pig iron output was limited by the quantity of ore she was able to import. The following table, showing the coke available for consumption in France and Germany, the pig iron output in France and Germany, and the iron ore

available for consumption in Germany, will give a general impression of the post-war position of the two countries in this respect.*

THOUSANDS OF METRIC TONS.

Year	France		Germany ^a		
	Coke Available for Consumption ^b	Pig Iron Production	Coke Available for Consumption ^b	Pig Iron Production	Iron Ore Available for Consumption ^b
1913 ^c	9,956	9,077	19,300	10,916	20,907
1919.....	2,524	2,412	20,786	5,654	10,556
1920.....	5,079	3,317	20,691	7,044 ^d	11,244
1921.....	3,506	3,360	22,452	7,845 ^d	12,379
1922.....	5,707	5,124	22,002	9,396 ^d	16,821

^a Excluding the Saar.

^b Production, plus imports, minus exports. Germany's deliveries on the reparation account included in the exports.

^c Within the frontiers of 1922. See note to table on p. 71, Chap. III.

^d Figures from *Stahl und Eisen*, Feb. 12, 1925.

In the four-year period, 1919 to 1922, France was able to procure annually from all sources somewhat less than half the quantity of coke available in 1913, and this decreased supply was reflected in the pig iron output. Germany on the other hand had available for consumption, even after the deliveries on the reparation account, considerably more coke than before the war, but her supply of iron ore was much less.

* Compiled from the various official statistics of the countries concerned.

The reduced pig iron output of both Germany and France resulted largely from diminished exchanges of Ruhr coke for Lorraine ore. The actual shipments, compared with the year 1913, were as follows:

Average Monthly	Coke from Ruhr and Rhineland to Lorraine Region (France and Luxemburg) ^a (Metric Tons)	Iron Ore from Lorraine Region to Ruhr and Rhineland. ^b (Metric Tons)
1913.....	700,000	400,000
1919.....	236,000 ^c	150,000
1920.....	354,000	210,000
1921.....	349,000	195,000
1922.....	497,000	236,000

^a *Jahresbericht der Aktiengesellschaft Reichskohlenverband 1923-24.*

^b *Statistisches Jahrbuch für das Deutsche Reich, 1922 and 1923.*

^c Average for four months, September-December.

The coke shipments from the Ruhr and Rhineland to the Lorraine region, except for the first eight months of the year 1919, were made on the reparation account. The iron ore received in return was secured through ordinary commercial transactions. It will be observed that, while both the coke and the iron ore shipments between the Ruhr and Lorraine were reduced in approximately the same proportions, the falling off in the pig iron output in France in relation to the pre-war figure was considerably greater than in Germany. The explanation of this lies for the most part in the fact that

Lorraine is much more dependent upon the Ruhr for coke than the Ruhr on Lorraine for iron ore.

In 1922, the last year before the occupation of the Ruhr, Germany (exclusive of the Saar) had available for consumption (production plus imports, the exports from present Germany being negligible) 16,994,000 tons of iron ore. The following table will show the sources of supply, compared with the supply of the same territory in 1913.

ORIGIN OF IRON ORE SUPPLY OF GERMANY.*
(Post-war Frontiers, Excluding the Saar)

	1913 (Metric Tons)	1922 (Metric Tons)
Germany (home production)	7,309,000	5,980,000
France and Luxemburg...	4,778,000	2,835,000
Sweden and Norway.....	4,867,000	5,509,000
Spain	3,632,000	1,329,000
Other imports	1,544,000	1,341,000
Total	22,130,000	16,994,000

* *Wirtschaft und Statistik* No. 5-3 Jahrg., March, 1923, p. 131.

Germany was able to supply herself with ore in addition to her domestic production more readily than France could secure additional coke. Unfortunately for the Lorraine region, this is a condition which is likely to persist for many years, although eventually the iron industry of the Ruhr will urgently need the ore of Lorraine. Manifestly, however, due to the proximity of the two regions, and in the light of pre-war conditions and tendencies, a

greater volume of exchange of coke for ore would be of immediate advantage to both Germany and France.

The question of coke deliveries on the reparation account was inseparable from the question of fuel supply in general. Throughout the year 1919 and most of 1920 the urgent need in France and the other Allied countries of the Continent was primarily for fuel, rather than for any particular type of fuel. A somewhat similar condition existed up to the end of the year 1922 or even later; but by the latter part of 1920 the requirements of the French metallurgical industry began to receive special consideration. From that time until the occupation of the Ruhr the question of a deficit in coke deliveries was frequently discussed in the French press and was almost continuously before the Reparation Commission.

In addition to coal in general, both coke and a certain amount of fine coal suitable for coking were demanded by France. When the demands of the Reparation Commission for coke were increased the Germans began to display a certain reluctance to meet the new requirements. The experts of the Commission reminded them that the coke production in the Ruhr was nearly equal to the pre-war figure; that a much larger proportion of the coal produced was being made into coke than before the war; and finally that the Allies could reasonably demand the delivery to the Lorraine region of a percentage of the present coke production equal to the

percentage supplied to the same region before the war.

The Germans declared that deliveries of coal diminished their ability to deliver coke. Moreover, they argued that their own coke requirements were relatively greater than before the war, owing to the fact that they had to supply increased quantities to the nitrogen plants for producing the fertilizer so urgently needed by German agriculture. Finally, they invoked the familiar argument that their industry in general must be left with sufficient fuel to make possible the execution of the general reparation program.

Whatever the merits of the larger and more general considerations advanced as arguments by the Germans, it is an undisputed fact that never at any time since the Armistice have the deliveries from the Ruhr to Lorraine of coke and coking coal together attained relative to the coke output of the Ruhr district the same proportions as before the war. The average monthly production of coke in the Rhineland and Westphalia in 1913 was 2,242,000 tons, of which 700,000 tons, amounting to 31.2 per cent of the output, was shipped to the Lorraine district (present France and Luxemburg). Since the war the average monthly production and shipments to the Lorraine region are shown on page 165.*

It is true that the shipments to France of coal as

* *Jahresbericht . . . Reichskohlenverband.*

THE COAL PROBLEM IN 1921 AND 1922 165

Average Monthly	Production Ruhr and Rhineland	Shipments to Lorraine Region	Percentage of Output
1913.....	2,242,000	700,000	31.2
1919.....	1,490,000	236,000 ^a	15.8
1920.....	1,752,000	354,000	20.2
1921.....	1,981,000	349,000	17.6
1922.....	2,133,000	497,000	23.3

^a For the four months (September-December) of reparation deliveries only.

distinct from coke have been relatively greater than before the war, although considered apart from the coke shipments they have not been nearly sufficient to compensate for the loss of output of the devastated mines. There can be no doubt, however, that Germany has consumed much more coke in relation to her pig iron production than was consumed in the same territory before the war. The explanation which has been given by the German Government is that the urgent need in Germany has been primarily for fuel, whether coal or coke; that a larger proportion of the coal output than before the war has had to be made into coke in order to procure the extra by-products—benzol, ammonium sulphate, coal tar, and the like,—demanded by the Allies; and that German consumers, such as railways, for example, have been obliged to burn coke because they could not get coal. It was implicit in the German argument that if France would consent to reduce her demands for coal, more coke would be furnished, although no specific promise to this effect was ever made to the Reparation Commission. In any case,

however, the demands for coal were not materially reduced.

The Ruhr-Lorraine system has been the victim of politics. Under the general question of reparation the whole matter of coal and coke deliveries has been dealt with by political rather than economic methods, and the iron and steel industry has had to suffer the consequences.

Whenever an attempt has been made to reach a direct agreement between the industrial leaders of France and Germany, the consent of the two governments has been necessary. Moreover, the very existence of Germany's obligations under the coal clauses of the treaty has added to the difficulty of business-like relations between the Ruhr and Lorraine. The French iron masters have always been able in the last resort to call upon their government to demand the immediate quantities of coke required, and consequently nothing like a free mutual agreement has been possible. After the passing of the fuel emergency of the years 1919 and 1920 the German deliveries were insisted upon by the Reparation Commission more as a form of immediate payment than with a view to general reconstruction; and the result was to increase the difficulty of dealing with the economic relations between the Ruhr and Lorraine.

III. FINANCIAL CONSEQUENCES OF COAL DELIVERIES

Due to the financial concessions made to Germany under the Protocol of Spa, the financial aspects of

coal deliveries on the reparation account did not assume serious importance until after February 1, 1921. Up to that date the deliveries had amounted to approximately 19,500,000 tons, and Germany had received from the Allies about 400,000,000 gold marks, in what amounted for all practical purposes to outright payment. Even though the entire quantity of coal be taken into consideration, Germany received slightly more than 20 gold marks, or nearly 5 dollars in foreign money for every ton shipped out of the country on the reparation account. This was in the aggregate slightly more than the coal cost the German government,¹⁴ so that the effect on the budgetary situation was on the whole beneficial. The effect, moreover, was also reflected in Germany's international balance of payments and in the foreign exchange value of the paper mark.

While it is true that the export of nearly 20 million tons of coal at the high prices in vogue in 1919 and 1920 would have been of immensely greater

¹⁴ Prices are those published by the German Government in the *Reichsanzeiger*, computed in gold according to the exchange rates quoted by the Federal Reserve Bank of New York. Since (a) the average internal price throughout the period was less than 15 gold marks per ton, (b) the coke included in the total figures of deliveries is computed in terms of coal (at the ratio of three tons of coke to four tons of coal), and (c) the price of coke bore approximately the same ratio to that of coal throughout the period, it may be assumed that the government paid the mine owners not more than 15 gold marks per ton for the total quantities involved. The cost of transporting this coal to the frontiers of the receiving countries was less than 5 gold marks per ton, so that the total expenditure of the government was less than the sums received from the Allies.

advantage, nevertheless it is not incorrect to consider the total coal shipments up to February 1, 1921, as a part of Germany's exports. The net effect on her international trade was equivalent to the export of about twenty million tons of coal at a rather low margin of profit.

With the termination of the Spa agreement on January 31, 1921, the situation from a financial point of view was completely changed. From that time forward Germany was required to deliver large quantities of coal and coke without payment. Moreover, a few months later the reparation debt was formally fixed at 132 billions of gold marks, and the London schedule of payments was put into operation. Before the end of 1921 something of the financial significance of the reparation clauses of the Treaty of Versailles began to be apparent.

Coal deliveries, it is true, have constituted only a part of the payments made by Germany, but in their effects on the German financial situation, both internal and external, their consequences have been of the same nature as payments in cash. Indeed, with respect to the foreign trade of Germany, the deliveries of coal have had consequences relatively more damaging than the payments in cash.

Germany has consistently argued that her fuel supply was inadequate. Something approximating proof of this contention began to be apparent in 1921. Reference has already been made to the fact that Germany suffered relatively less than any other

industrial nation from the business depression of 1920-21. She was still living in a period of currency and credit inflation, when the other great industrial nations, particularly Great Britain and the United States, were in the throes of deflation. Moreover, she was being driven by economic necessity to make a desperate effort to regain her former position in world trade. At the same time German manufacturers and industrial leaders, encouraged by the government to furnish employment to labor, took advantage of the low wage level (due to inflation) to expand and improve their plants.

The best proof that Germany actually did need more fuel than the supply left available for consumption after the deliveries on the reparation account, lies in the fact that she began in 1921 to import coal from Great Britain and other countries. At first the quantities involved were relatively small, but by the summer of 1922, the imports from all sources were considerably greater than the shipments to the Allies on the reparation account.

Importations from Great Britain may be partly accounted for by the fact that British coal merchants before the war were accustomed to sell something like 10,000,000 tons a year to northern and eastern Germany, and they were now making an effort to regain this trade. During the greater part of the years 1921 and 1922 German internal prices on a gold basis were relatively stable while British export prices were falling. The British exporters, conse-

quently, were able to regain some of their trade, even in 1921, and by 1922 they were selling to Germany nearly as much coal as before the war.

It should be remembered, however, that the German government either encouraged or acquiesced in these importations of British coal, and this in spite of the adverse effect on Germany's foreign trade. Therefore, unless we are prepared to believe that Germany wished deliberately to ruin her international financial position, the conclusion is inescapable that she did urgently need more coal than was left to her after the deliveries on the reparation account.

Beginning in 1922, Germany's imports of coal began to have a serious effect on her trade balance. During several months of that year her imports were greater than her deliveries on the reparation account. Taking the year as a whole, however, she imported in round numbers, 15,000,000 tons¹⁵ and delivered to the Allies 17,000,000 tons.¹⁶ A large part of the imports in 1922 were from Great Britain, the figure being 8,000,000 tons,¹⁷ or 53 per cent of the total. About 3,000,000 tons were received from Polish Upper Silesia after the partition of the province, and the remainder came principally from Czecho-Slovakia and the Saar.

¹⁵ *Colliery Guardian*, March 9, 1923. Total figure includes about 2,000,000 tons of lignite imported from Czechoslovakia.

¹⁶ Official figures of Reparation Commission, coke calculated in terms of coal.

¹⁷ *Colliery Guardian*, March 9, 1923.

Until the middle of June, 1922, the entire province of Upper Silesia still formed a part of the political and economic structure of Germany. It is true that the coal produced in the district was distributed according to the instructions of the Reparation Commission; but even so, the rest of Germany received on an average more than 1,000,000 tons per month throughout the period of Allied regulation. The significant fact in this arrangement, from a financial point of view, is that Germany received this coal from Upper Silesia without any effect on her balance of international trade: it did not represent imports of coal. When the southeastern portion of the province, including about three-fourths of the coal production, was turned over to Poland, the situation was completely changed. Naturally, that part of Germany normally dependent upon Upper Silesian coal continued to buy it, but every ton received from the Polish side of the province represented an import.

In the case of the imports from Great Britain a practice was followed which borders on economic absurdity. Coal was shipped from British ports to Rotterdam, thence up the Rhine in barges to be distributed from river ports to consumers in Germany. Then *the very same barges* were loaded with German coal to be shipped down the Rhine to Rotterdam for trans-shipment to French ports. Some of the British coal thus imported was actually consumed in the Ruhr district. Imagine a coal barge at the Rotter-

dam docks being unloaded into a ship bound for a French port while a British ship from New Castle or Cardiff waits impatiently to unload its own cargo of coal into the same barge to be shipped to the same point where the barge was first loaded with German coal!

The effects of reparation deliveries on Germany's international financial position were doubly injurious. To evaluate the financial consequences involved it is only necessary to remember that the deliveries on the reparation account had to be paid for out of the German budget, and that imports of coal, since they were largely for state-owned railways, had also to be paid for from the same source. Moreover, the delivery of coal to the Allies without payment had the effect of nullifying just so much of the total of Germany's exports, whereas the payment in foreign currency for the coal imports necessitated thereby had a further unfavorable reaction on her balance of trade. The effect of the whole transaction really was double, both on Germany's internal and on her external financial position. In its final consequences, of course, it only added to the burden imposed by the London schedule of reparation payments.

There is no intention to imply that Germany would in the long run have improved her international financial position by refusing to import coal. It is true, of course, that the coal imported for use by German industries served to increase the productive

capacity of the country and the potential capacity to export industrial products. All that is being here argued is that the reparation deliveries made it necessary to import much larger quantities than would otherwise have been the case. In this instance, as in the matter of the coke supply of Lorraine, the larger program of reconstruction was in a great measure sacrificed to the exigencies of politics. The peoples of France and the other Continental Allies had been taught to expect immediate and tangible results from the reparation clauses of the Treaty of Versailles, and the simplest way for the politicians to get them was to ensure the delivery of coal.

IV. GERMANY DECLARED IN DEFAULT

By the end of 1922 the whole reparation question was fast approaching a crisis. In the autumn of that year Germany had been granted a second temporary moratorium on cash payments, and the prospects for any considerable receipts in the following year were doubtful to say the least. In the view of the government then in power in France, extreme measures, such as the seizure of additional German territory, were called for. In order to provide a legal basis for such measures—satisfactory to France at least—it became necessary to have a specific declaration from the Reparation Commission to the effect that Germany had failed to meet her obligations under the Treaty of Versailles.

Pursuant to the instructions of his Government during the month of December, 1922, the French Delegate and President of the Reparation Commission requested that Germany be declared in default, first, on the delivery of timber, and second, on the delivery of coal and coke. A default on timber was declared by a majority vote on December 26, and the Allied Governments were notified accordingly.¹⁸ A meeting to consider the question of a default on coal and coke was scheduled for January 9, 1923, and the German Government was invited to send representatives for a hearing before the Commission. A brief account of this meeting, taken from the private notes of the author, who was present in his capacity as an international official of the Reparation Commission, will be found in the appendix of this book.¹⁹ Here it will suffice to record the essential fact of the conference.

On technical grounds alone, a declaration of default on coal was a foregone conclusion. The deliveries actually made to date were unquestionably at least 20 per cent short of the demands formally presented by the Reparation Commission. Moreover, the Commission was already familiar with every argument that could be advanced by the German representatives in mitigation of the shortage. In fact, when the German case was fully presented at the meeting it was still clear beyond the shadow

¹⁸ See *Report on the Work of the Reparation Commission*, Vol. V, p. 248.

¹⁹ See Appendix B, p. 292.

of a doubt that there was a deficit of from 12 to 14 per cent that could not possibly be excused on the ground of physical impossibility. It was only when the matter of coal deliveries was considered in relation to the German financial situation and the broader requirements of European reconstruction that the equity of a declaration of default might have been gravely questioned.

It was, in fact, questioned by the British Delegate, Sir John (now Lord) Bradbury, who after the retirement of the German representatives advanced a vigorous argument in favor of a wider consideration of the coal problem in its relation to the reparation problem as a whole. Even more positively—if somewhat less vigorously, due to his unofficial position—Mr. Roland W. Boyden, speaking entirely in his personal capacity, called attention to the necessity of attacking anew the problems arising out of the reparation clauses of the Treaty of Versailles.²⁰ But the majority of the Reparation Commission (the French, Belgian, and Italian Delegates) took the view that they were called upon merely to decide whether Germany had failed to carry out the mandates of the Commission. Under such conditions the answer could be only in the affirmative. The decision was taken by a majority vote—the second of any importance in the history of the Reparation Commission—and the Allied Governments were

²⁰ See Appendix B, p. 296, for the full text of Mr. Boyden's remarks.

immediately notified that Germany was in default on coal deliveries within the meaning of paragraph 17 of Annex II of Part VIII of the Treaty of Versailles. Thus was established the legal basis—such as it was—of the occupation of the Ruhr.

CHAPTER VII

THE OCCUPATION OF THE RUHR

To discuss the occupation of the Ruhr is to invite controversy. Emotion and sentiment have played so great a rôle in the formation of popular opinion concerning the state of affairs existing in post-war economic and political Europe that any attempt at objective analysis of the most spectacular result of that state of affairs is certain to meet with the condemnation of the extremists of all categories. But an attempt must nevertheless be made to deal with both the causes and the effects—in so far as they can be appraised—of the invasion by France and Belgium of the industrial heart of Germany; for if the full significance of this resort to military action is to be understood in its relation to the Ruhr-Lorraine industrial problem, the whole operation must be viewed in perspective. The discussion which follows is therefore offered without apology. If the most ardent advocates and defenders of the occupation, on the one hand, and its bitterest opponents, on the other, are able to say that their respective contentions have been reinforced, then the apparent paradox will have to stand.

I. THE CAUSES: WERE THE IRON MASTERS RESPONSIBLE?

The combined military and economic operation initiated by France and Belgium on the morning of January 11, 1923, was not the result of any specific cause. It was rather the outward manifestation of what has often been described as a deadlock in the political and economic affairs of Europe. The occupation of the Ruhr was a desperate attempt—forced by a public opinion that had perhaps been misled—to solve certain fundamental problems which, four years after the signing of the Armistice, continued to dominate the economic and political life of Europe. Those problems were (1) that of securing an adequate supply of fuel for the French iron industry in Lorraine; (2) that of French and Belgian security from German aggression; and (3) that of obtaining effective reparation payments. Although the present study is concerned primarily with the first problem, it must be kept constantly in mind that this is so intimately related to the other two as to be inseparable from them.

Did France occupy the Ruhr in the hope of mitigating the dependence of the Lorraine iron industry? A dogmatic yes or no could not be justified by the evidence. It will be possible, therefore, to give only a general and in some respects an inconclusive answer to this specific question.

To many observers of the European economic situation the most logical conclusion as to the motive

of France in seizing the great German coal mining region is that the Ruhr was occupied in response to the demand of the Lorraine iron masters for an assured supply of fuel. As evidence to support this view, it is pointed out that never at any time since the war had the Lorraine blast furnaces received sufficient coke to permit the full development of their productive capacity, and that Germany's default on coal and coke deliveries was the official reason announced by France and Belgium for their resort to military action.

Before making the obvious deduction from these undisputed facts, however, it will be well to raise the question whether the leaders of the French iron industry were convinced that the occupation of the Ruhr would be likely to remedy the situation. The iron masters, in coming to a conclusion in this vitally important matter, were faced with two problems: first, that of securing an immediate increase in their coke supply; and second, that of effecting an arrangement whereby they would be permanently in a position to secure as much coal and coke from the Ruhr as their blast furnaces and steel plants might require. The second problem was manifestly the more important in the long run; and although its solution did not necessarily exclude a satisfactory solution of the first, it is probably safe to assert that the French iron masters would have been content to receive even smaller quantities of German fuel in the immediate future in return for the prospect of

much larger quantities later on. The attitude of the iron masters, therefore, apart from their patriotic desire as Frenchmen to work for a solution of the more general economic and political problems of France, was probably determined by what they considered the best policy for a long-run solution of their own particular problem.

Due to their long commercial relations with the German coal and coke industry, they were doubtless better informed as to the true situation in the Ruhr than any other group of people in France. They were, therefore, in a better position to foresee the the consequences of the military occupation of that district than either the politicians or the general public. They knew, for example, that France would be unable to exploit the Ruhr coal mines without the co-operation of the German population. The reason was that France had not sufficient man power to do it. Even though she might have hoped to force a certain number of German laborers to work the mines by the menace of starvation, there was almost no possibility that the engineers and directors would take orders from the French army. It was in fact shown by subsequent events that neither the directors nor the miners would do so. While it would be futile to argue that the French iron masters foresaw exactly the future course of events, it is nevertheless safe to assert that they knew how remote was the possibility of securing German co-operation; that whatever their opinion of the occu-

pation of the Ruhr on ethical or moral grounds they did not seriously advocate it as a means of immediately increasing their coke supply.

But, it may be asked, was not the Ruhr occupied primarily for the purpose of exerting pressure on the German mine owners and the German Government with a view to obtaining the assurance of a permanent supply of German coal and coke? Before answering this question in the affirmative it should be noted that France was already in a position, long before the beginning of the year 1923, utterly to strangle and disrupt the German industrial system without the occupation of any new territory. The report of M. Dariac¹ (at that time President of the Finance Commission of the French Chamber of Deputies) makes this abundantly clear. France held the great Rhine ports of Duisburg and Ruhrort, from which a large part of the coal output of the Ruhr mines is shipped, together with the intricate network of railways centering around them and around Düsseldorf. This in itself was equivalent to holding a large part of the Ruhr. France held in addition practically all of the territory on the left bank of the Rhine with its highly developed industrial and transportation system. Had she wished to do so she was already able to threaten so complete a disruption of German economic life that neither the German Government nor the mine owners would

¹The Dariac Report, published in the *Manchester Guardian* of Nov. 2, 1922, and March 5, 1923.

have dared to refuse an immediate increase in coke shipments.

In the matter of effecting an arrangement whereby the Lorraine iron industry would be assured of a permanent coke supply, the same reasoning is valid. If it had been a question of applying military and political pressure in order to enforce a permanent agreement with the German mine owners or the German Government, the means for applying such pressure were already at hand. Unless it be assumed, therefore, that the French iron masters were in favor of annexing the Ruhr outright and of eventually exploiting it themselves—and they were in a particularly good position to realize the impossibility of any such undertaking—it is fairly safe to conclude that many of them did not favor the occupation, because they realized that from an economic point of view it was useless, dangerous, and certain to be costly. On the contrary, some of them, at least, had reached the conclusion that more was to be obtained from Germany by negotiation than by the use of force. Certain industrial leaders, notably M. Loucheur and Senator de Lubersac, had found it possible to reach businesslike agreements both with the German Government and with individual German industrialists.²

No attempt is being made here to demonstrate that the fuel requirements of the Lorraine iron industry had nothing to do with the occupation of the

²See Appendix A, p. 285.

Ruhr. The failure of Germany to deliver the full quantities of coal and coke demanded by the Reparation Commission undoubtedly added to the feeling in France and Belgium that drastic measures of some kind must be taken. Neither is it being argued that the French iron masters were unanimous in their attitude, either of opposition or approval, nor even that they could have either caused or prevented the resort to military action had they been unanimous. But at the time the German industrial center was seized the fuel needs of the iron industry constituted only a part of the general political and economic problem confronted by France, and the occupation of the Ruhr can be amply accounted for on other than strictly economic grounds. It may be safely asserted, therefore, that the hope of mitigating the dependence of the Lorraine iron industry on the coal and coke of the Ruhr was at most no more than a contributory cause of the resort to military action.

The real causes of the occupation of the Ruhr are rooted in the situation created by the Treaty of Versailles. In England and America, as well as on the European continent, a few students of international affairs have understood and adequately described that situation.³ Whatever their point of

³ See Keynes, J. M., *The Economic Consequences of the Peace*, and *A Revision of the Treaty*, 1920 and 1922; Baruch, B. M., *The Making of the Reparation and Economic Sections of the Treaty*, 1920; Bass, J. F. and Moulton, H. G., *America and the Balance Sheet of Europe*, 1921; Moulton, H. G. and McGuire, C. E., *Germany's Capacity to Pay*, 1923. A longer list of publications on this subject will be found in the bibliography at the end of this book.

view and whatever solution they have had to offer, they have agreed almost without exception upon the existence of a political and economic deadlock. Some even went so far as to say that the occupation of the Ruhr was practically inevitable in the general sequence of events.⁴ No attempt will be made here to do more than give a brief outline of the state of affairs which has already been described in so much detail; but some discussion is required of the principal elements of the situation in order to justify the contention emphasized above that the need of the French iron industry for fuel was not the sole or even the principal cause of the resort to military action.

It will be remembered that during the Peace Conference two fundamental problems demanded solution: the problem of French and Allied security, economic and military; and the problem of repairing the damages caused by the war. Even in the highly charged emotional atmosphere of Paris in the spring of 1919 many economists and statesmen were able to see that the two demands were in the last analysis mutually incompatible; but a treaty had to be written and some sort of formula had to be invented flexible enough to meet the changed conditions that time might bring. The result was the Treaty of Versailles, including the covenant of the League of Nations.

⁴ See Bass and Moulton—*America and the Balance Sheet of Europe*, pp. 290-2.

The total reparation demands of the Treaty were left indeterminate with a provision that the German debt should be fixed by the Reparation Commission by May 1, 1921. The main categories of claims, however, were specified, and these included payment to the Allies of sums expended and to be expended during and after the war for military pensions and separation allowances—items which more than doubled the total reparation debt. It will not be necessary here to describe the long controversy between the American Delegation to the Peace Conference and the European Allies over this question, except to recall that the Americans vigorously opposed the inclusion of pensions and separation allowances in the reparation demands, on the ground that it was contrary to the Armistice and previous agreements with Germany. They were finally overruled, but not until they had gone on record with some of the most cogent arguments for a genuine settlement of the European economic problem that were heard in the Peace Conference.⁵

Practically all German and neutral and many Allied economists of repute agreed that the payment by Germany of the total debt which under the terms of the Treaty must inevitably be fixed by the Reparation Commission would be impossible. It is therefore safe to say that under such conditions the German government, even though it had been ever

⁵The addresses of Mr. John Foster Dulles, published in the appendix to Mr. Baruch's *Making of the Reparation . . . Sections of the Treaty*, are especially worthy of mention in this respect.

so much stronger than it actually was, was utterly unable to formulate and carry out a consistent reparation policy. In the Allied countries, on the other hand, and particularly in France, it was believed with a sort of religious fervor that Germany was solely responsible for the war and that she could and ought to pay even more fantastic sums than those stipulated in the Treaty of Versailles. Moreover, the Allied ministers and politicians, faced as most of them were with national and international bankruptcy, encouraged their people to believe in the magnificent promises held out by the Treaty. It is thus clear that long before the fixing of the total German debt in the spring of 1921 the foundations were already laid for the deadlock between France and Germany.

When the total obligation was fixed at 132 billion gold marks, Germany agreed, under the menace of energetic military "sanctions"—notably the occupation of the Ruhr—to accept the terms of the London schedule of payments. She actually made most of the quarterly payments due in the calendar year 1921. Then her financial system collapsed. In the spring of 1922 she was granted a partial moratorium, but was required to undertake to deliver to the Allies goods amounting to 1,450,000,000 gold marks and cash to the amount of 750,000,000. Before the end of the year she had fallen behind in cash payments and a new temporary moratorium had been granted.

The question of payment in goods revealed the

economic dilemma of the reparation problem. Under the terms of the first moratorium France was accorded a credit with which to buy German goods during the year 1922 amounting to 950 million gold marks. By the end of the year she had placed orders amounting to less than 300 millions, and most of these were automatically taken up with coal and coke deliveries.⁶ It had long been evident to economists everywhere that unless France expected to use reparation receipts exclusively for the purpose of paying her foreign debts she could in the long run be paid only in goods, either imported from Germany or from some other source. But the French manufacturers and industrialists did not wish to see large quantities of German goods imported in competition with their own products; and whether their influence was the determining factor or not, only a small part of the credit for 950 million gold marks was actually used, and this chiefly for the purchase of raw materials.

But the general public understood little of the dilemma. To the people of France the problem was simple: Germany was not paying her debt. Moreover, the politicians at the head of the government were not disposed to clarify the issues, partly no doubt because they did not themselves clearly understand the situation and partly because it would have meant political suicide to tell the unvarnished truth

⁶ *Communiqué* of the Reparation Commission published in the *Paris Temps* and the *London Times* of April 25, 1923.

after so many years of dissimulation. They were in a position where they were simply obliged to find a scapegoat or cut their own political throats.

Much misunderstanding and bad feeling in France resulted from the opposition of Great Britain. The popular belief is widespread in Europe and America that Great Britain has consistently opposed not only the occupation of the Ruhr but any workable agreement between France and Germany for the co-operative development of the Ruhr-Lorraine iron industry. It is pointed out that Great Britain's economic life depends in a large measure on her coal and iron industry. She was already being hampered before the war by German competition resulting from the high state of organization of the Ruhr-Lorraine system. The war greatly weakened Germany as a competitor by reducing her iron and steel output. A Franco-German economic alliance, or the control by either France or Germany of the Ruhr and Lorraine would renew and perhaps intensify the competition of the Continental iron industry.

What is left out of account in such a statement of the case is that Continental Europe is not merely a competitor but an important customer of Great Britain. There are doubtless people in England blind enough to believe that national prosperity can be secured through the destruction of the prosperity of neighboring nations, but it is safe to say that the doctrines of those people are now largely discredited. Their views might have received a certain amount of

consideration during and immediately after the war, but the experience of Great Britain in the five years following the end of hostilities was such as to leave no doubt in the mind of the nation as a whole that national prosperity is possible only in a prosperous world. The best proof that this is actually the opinion of the vast majority of the British people lies in their insistence upon a speedy and permanent solution of the European problem, particularly the reparation problem.⁷

It should be remembered, moreover, that the potentialities of the Ruhr-Lorraine system as a competitor of the British iron and steel industry have not been changed by the war. Before 1914, as we have seen, the two great Continental deposits of raw materials were in fact being utilized in combination, and the British iron masters showed no particular disposition to resort to political measures to destroy their competitors. It is a matter of common knowledge that the British metallurgical industry has been steadily growing for a century and more. Before the war the leaders of the industry were able to see that inevitably the Ruhr coal and the Lorraine iron ore would be utilized more and more as complementary subdivisions of a great economic unit; and they are equally certain now that the same tendency must eventually prevail if genuine economic recovery in Europe is to be realized. And who would be so

⁷See extract of an address by the British Prime Minister on July 27, 1923, p. 197, this chapter.

foolish as to suggest that Great Britain would not now heartily welcome the re-establishment of the European economic system substantially as it existed until August 1914? The importance of a clear understanding of the British position in this matter can hardly be overemphasized.⁸

The deadlock in Europe was rendered more complete by the question of French security. In France this was unquestionably an argument of great potency in favor of drastic measures. It was realized by French statesmen that in order to make large reparation payments either in goods or in cash,

⁸ Writing in *The Nation* and *The Athenæum*, London, June 9, 1923, Mr. W. T. Layton, Editor of *The Economist*, makes the following declaration:

“At intervals during the last few months, the Press in various countries has hinted, with an air of mystery, at attempts to form a great Franco-German coal, iron, and steel combine. This is a natural and not at all unlikely development. But we are getting into the region of phantasy when the conclusion is drawn that such a combination would wield overwhelming economic power in Europe, and prove fatal to the British iron and steel industries; while the story becomes definitely mischievous when it is suggested that through fear of such an amalgamation Great Britain has used her influence to prevent an industrial understanding between France and Germany. This idea is the reverse of the truth. Lorraine ore and German coke were, in fact, combined in the hands of the German Steel Cartel before the war, and Great Britain has, therefore, already had to face this particular combination of resources in circumstances which were very favourable to Germany. Preferential railway rates were in force for heavy traffic between Westphalia and Lorraine, export was encouraged at the public expense, and the whole organization was administered with high efficiency. It is true that in 1913 the German frontier only included half of the Lorraine iron ore fields. But it did include the largest and most up-to-date of the Lorraine steel works, and Germany was able to draw from the Briey Basin, just across the border, any additional ore supplies she needed without economic hindrance. But in spite of this competition, British iron and steel exports steadily increased.”

Germany would have to build up an economic machine that would make her potentially as dangerous as before the Great War. Without the three-power treaty with Great Britain and the United States and with small confidence in the League of Nations, what promise of security had France? Many eminent Frenchmen were convinced that France must choose between reparation and security. Some were no doubt persuaded that it would be better deliberately to sacrifice the first in order to obtain the second by destroying Germany's economic system and thus rendering her powerless to undertake a war of revenge.

A forceful statement of the French position was given in the *Baltimore Sun* of Dec. 14, 1923, in which a high official of the French Government closely associated with Premier Poincaré is reported to have said:

"Security is, for us, the one really vital and imperative need. Reparations come second. We shall, of course, continue our pressure on Germany with a view to making her pay her war debts, but we are far more concerned to prevent any revival of her military power. France will shrink from no measure, however drastic, which may be necessary to insure her future safety *vis-a-vis* Germany.

"On this point M. Poincaré speaks not for himself, but for all France, which is absolutely united in its determination to make the country safe for this generation and its immediate posterity. The war brought security to England by eliminating German sea power, as also to Italy by so rectifying her frontiers as to make them virtually impregnable. France and Belgium, on the other hand, were left to face the potential menace of German revenge.

"You may destroy a navy completely by sinking its ships and

dismantling its dockyards, as England has destroyed the German Navy; but you cannot destroy an army so easily. The framework of Prussia's military system remains intact. The old organization could be made to function again without difficulty. Millions of men, all of them trained, are ready to spring to arms at a word. They lack only equipment, and now that Allied control is no longer exercised the German munition factories are working hard to repair this deficiency.

"If France stood with folded arms her arch enemy would be ready to renew the struggle in two, three or four years—perhaps more, perhaps less. Bear constantly in mind this key fact, that France is resolved at all costs never again to undergo the agonies of German invasion, and you will eventually have to admit that our policy, now so bitterly but mistakenly criticized in England, is logical, consistent and sound.

"Without a reasonable guarantee of immunity from attack, life would be simply intolerable to us French. On every other problem of post-war settlement we are open to argument or persuasion, prepared as we are to make real sacrifices for the peace and economic health of Europe; but on this one question we are and shall ever remain obdurate. To 40,000,000 Frenchmen the watchword is 'safety first,' and we shall continue to obey it, come what may."

All the complex forces of opinion described above existed simultaneously in France in the latter part of 1922. The general public understood little or nothing except what was taught by the politicians through the subservient press—which was in substance that Germany was withholding the money due the French war victims and using it to prepare for a war of revenge. Many of the economists and statesmen who understood the true situation were honestly in doubt as to the best course to pursue. They realized that, whatever might have been the case if a genuine effort towards reconciliation with

Germany had been made at the end of the war, the hatred of the German people had been enormously intensified by the French policy of the past three years. Those leaders who believed that reconciliation was still possible and dared to attempt a truthful statement of the existing situation were howled down as pro-Germans. The more rabid of the French nationalists had been clamoring for the occupation of the Ruhr ever since the treaty came into force, and the Allied governments jointly had already threatened such action on at least two occasions. Even the politicians and the general public realized that the efficacy of mere menaces could not go on forever. The pressure of public opinion became so strong that something had to be done. The line of least resistance for the politicians at the head of the French Government was military action.

The real causes of the breakdown of the reparation program at the end of the year 1922 arose out of the Treaty of Versailles. Mr. Boyden was right.⁹ The default on coal deliveries was an incident, a mere technical pretext for the occupation of the Ruhr. The default was voluntary only in a purely technical sense of the word. A general failure to meet the reparation obligations was certain from the day the Treaty was signed, and the occupation of the Ruhr was inevitable from the time it was first publicly threatened. The only hope of successfully meeting the situation that was bound to develop

⁹ See Appendix B, p. 296.

lay in the power theoretically vested in the Reparation Commission to modify the demands of the Allies. But the Reparation Commission was in practice subject to the will of the governments upon which it depended; these in turn were at the mercy of the public opinion which they themselves had fostered—the public opinion which demanded and expected the payment of fantastic sums by Germany, with little or no appreciation of what would be involved in such payment. In the face of such a deadlock, and with the politicians in power unwilling or unable to cope with the reality of the situation, it is difficult to see how anything but an act of desperation could have resulted.

II. THE EFFECTS

It is still too early to attempt any comprehensive estimate of the effects of the occupation of the Ruhr. Indeed the consequences of that combined military and economic operation are so far-reaching and so complex in their nature that it is doubtful if an accurate evaluation in mathematical terms can ever be made of even the economic effects, while the political and psychological consequences will be still more difficult of appraisal. The present discussion, therefore, will be confined to a very general statement of the economic results and a brief analysis of some of the still more imponderable elements of the situation created by the occupation.

The economic effects might be compared to those

of a prolonged general strike. When the troops of France and Belgium moved into the Ruhr and the agents of their governments began to take over the control of the economic organization of the region, the local population, both official and private, received injunctions from Berlin to refuse to co-operate. Those injunctions were obeyed, and gradually but steadily the economic life of the most highly industrialized region in the world was brought to a standstill. The "passive resistance" was broken after a period of steadily increasing pressure by the invading troops, and at the end of eight months the German Government formally withdrew the orders forbidding co-operation. Production of coal was gradually resumed and the economic life of the region began once more to function.

A single table, showing coal and coke production of the district month by month, will suffice to indicate the general economic effects of what has been known as the struggle of the Ruhr.

From the point of view merely of coal and coke production the entire operation resulted in a loss to Europe as a whole for approximately one year of something like 60 per cent of the potential output of the Ruhr district. When account is taken of the rôle played by coal as the motive force of industry in general, some impression can be gained of the stupendous losses involved. But for all practical purposes the direct results of the first year of the occupation were much the same as might have come

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COAL AND COKE PRODUCTION IN THE RUHR.*

Thousands of Metric Tons

	Coal	Coke
Average monthly in 1922	8,046	2,083
January .....1923	7,722	2,129
February "	6,359	1,723
March "	5,874	1,619
April "	3,819	768
May "	2,642	507
June "	2,099	427
July "	1,766	353
August "	1,564	276
September "	1,727	265
October "	2,299	292
November "	1,956	362
December "	4,294	628
January .....1924	6,490	1,193
February "	7,582	1,442
March "	8,032	....

* *Jahresbericht der Aktiengesellschaft Reichskohlenverband 1923/24*, pp. 8-9.

from a great decrease in production for any other cause, such as a general strike. It is only when we attempt to appraise the results of the whole operation in still more general terms that the far-reaching nature of the struggle in the Ruhr becomes apparent.

The most serious effect of the Ruhr invasion was the resulting disruption of the European economic system. That system was already badly disorganized. The normal productive capacity of Europe had not been regained, and, what was still more serious, nothing like normal trade had been re-established. The occupation of the Ruhr with its attendant passive struggle came as a further impediment to a return to normal conditions.

All the countries in Europe suffered in varying degree from the ensuing loss of production and the disorganization of international trade. Germany, France and Belgium, as the countries most dependent on Ruhr coal and coke, were naturally the more seriously affected.¹⁰ Superficially, Great Britain appeared to benefit by the confused situation on the Continent, inasmuch as her exports both of coal and of iron and steel products were temporarily increased. But Great Britain's dependence upon world trade is such that whatever advantage she may have gained from an artificial stimulation of her export trade in certain lines was more than offset by the impossibility of re-establishing her normal trade relations.¹¹ Speaking before the Conservative Club of Glasgow on July 26, 1923, the British Prime Minister summarized the situation in the following pregnant phrases:¹²

"To my mind the first essential to combat the disorganization of the foreign markets is a settlement of the question of reparations with the Germans. The effect of the kind of occupation which is at present in force on the Ruhr is exactly the same on international trade as if you inserted the blade of your pen knife into the works of your watch.

"The whole of international trade is a mechanism of extraordinary delicacy and it functioned before the war in such perfection and with such absence of friction that few except those who had occasion to have special knowledge of it were aware of its exist-

¹⁰ See article of Delaisi, Francis, *Manchester Guardian Commercial*, Aug. 16, 1923.

¹¹ The Austrian, Polish and other industries were also temporarily stimulated.

¹² See *London Times* of July 27, 1923.

ence. People are learning now at a gigantic price the elements of economics and foreign exchange."

Did the occupation of the Ruhr accomplish its purpose? The answer to this question will depend upon what is considered to have been the purpose. If it was the aim of France and Belgium to demonstrate their power to disrupt the economic life of Germany, then they were unqualifiedly successful. If, on the other hand, the resort to military action was an attempt to solve the triple problem of (1) an assured fuel supply for the French metallurgical industry, (2) security from German aggression, and (3) the collection of reparation, the success of the undertaking is subject to serious doubt.

With regard to the fuel supply it may be safely asserted that nothing was gained. In the year 1923, the total receipts of coal and coke by France, Italy, Belgium and Luxemburg amounted to only 7,626,000 tons as against 18,062,000 tons in 1922 when no special military pressure was exerted.¹³ Even in 1924, after the passive resistance had been broken, the coke received by France and Luxemburg amounted to only 5,370,000 tons¹⁴ as against 5,810,000 tons in 1922. During the period of passive resistance in 1923, the invading forces were able to do practically nothing, except to seize and remove

¹³ Figures for 1923 from *Jahresbericht der Aktiengesellschaft Reichskohlenverband 1923/24*; for 1922 (calendar year) from official records of the Reparation Commission. Coke calculated in terms of coal for both years.

¹⁴ *Journée Industrielle*, Jan. 17, 1925.

certain quantities of coal and coke in accumulated stocks at the pit-heads. To operate any appreciable number of the mines with enforced labor or by the employment of troops was out of the question. In fact, no attempt at such procedure was ever seriously contemplated by the French and Belgian Governments; for they realized that such an undertaking would be utterly impossible, both because of the vast extent of the industrial organization involved and on account of the almost complete lack of personnel available for technical direction.

After the mines resumed operation by means of their own personnel, coke deliveries were resumed under a special agreement, in quantities roughly comparable to those furnished before the occupation. Coal deliveries, on the other hand, were recommenced only on a much smaller scale. With respect to actual results in increased coal and coke receipts, therefore, it may be safely asserted that the occupation of the Ruhr was worse than useless. With respect to the future, the results are hardly more satisfactory, since according to the Protocol of London of August 16, 1924, future coal and coke deliveries on the reparation account are to be determined by a mixed committee representing both the Reparation Commission and the German Government instead of by the Reparation Commission alone.

In the matter of security from German aggression it would be difficult to demonstrate that the occu-

pation of the Ruhr accomplished anything more than to increase the resentment of the German people towards France and Belgium. It is true that in so far as the economic strength of Germany was impaired the possibility of her becoming a menace to French security was delayed; but since France and Belgium disclaimed any intention to remain permanently in the Ruhr district, the occupation could only have the long-run effect of increasing whatever danger there was.

When we come to consider the question whether the invasion of the industrial heart of Germany was instrumental in obtaining reparation payments for the Allies we enter the field of pure speculation. If it be assumed that the political and economic situation of Europe had to become much worse before it could become better, it might be argued that the occupation of the Ruhr cleared the atmosphere and thereby hastened a settlement of the reparation question. Then if it be further assumed that the operation of the Dawes plan will result in effective receipts by the Allies comparable to the estimated capacity of Germany to make payments in her own currency, a plausible case might be made for the thesis that the invasion was successful in accomplishing the object so persistently announced by M. Poincaré.

But these are perhaps questionable assumptions. As far as the Ruhr-Lorraine industrial problem is concerned, the occupation has had this negative

value:—it has demonstrated the difficulty, not to say the impossibility, of solving a problem which is essentially economic by the application of political and military force.

PART III

THE FUTURE OF THE RUHR-
LORRAINE SYSTEM

CHAPTER VIII

THE PRESENT STATUS OF THE PROBLEM

In the preceding discussion we have been dealing in a general way with certain phases of the struggle of industrial Europe to resume the steady development that was so disastrously interrupted by the Great War. More specifically, we have been dealing with coal and iron; and since these two commodities are of fundamental importance in the broad scheme of industrial civilization, their production and distribution may properly be considered as an index of the rate of progress that is being made towards European and world reconstruction.

Just as coal and iron occupy a central position in the industrial organization of the world, so the industrial system of western continental Europe—the economic organization which has been repeatedly referred to as the Ruhr-Lorraine system—presents the chief unsettled problem of the coal and iron industry. The situation created by the disruption of that system has been treated, therefore, as a basic element in the recovery of Europe from the ravages of the war. It has been the intention to deal with the problem from a European and world point of view, accepting as a truism the proposition

that all nations are in a varying degree economically inter-dependent.

We have seen that Europe possesses certain resources of coal and iron ore, which have been measured and calculated with a fair degree of precision; that a large proportion of these resources are concentrated in a small block of territory on either side of the Rhine near the northwestern edge of the continent; and finally, we have considered it safe to assume that without the continued utilization of the available resources of coal and iron on a scale as great as before the war, Europe will not be able to regain her former economic status as the workshop of the world, and her great industrial population will not be able to maintain even the moderately high standard of living of pre-war days.

The measures taken by the Peace Conference and the efforts of the Reparation Commission to re-establish the normal distribution of coal upon which the prosperity of industrial Europe so largely depends have been passed in review; and we have seen that the Ruhr-Lorraine industrial problem, for good or for evil, is inextricably entangled with the reparation question. In discussing the coal deliveries made by Germany on the reparation account we have seen that the matter of an adequate supply of coke for the Lorraine blast furnaces has been intimately related to the great financial problems of the German government in coping with the reparation debt. The one outstanding conclusion that seems justified from

our analysis of the reparation coal deliveries is that the Ruhr-Lorraine system has been the victim of politics, that political interference with economic forces has been largely responsible for the failure of that system to resume its normal functions in the economic life of Europe.

Finally, we have seen that the complicated structure of the reparation settlement broke down at the end of the year 1922 and that France and Belgium occupied the Ruhr. In dealing with the causes of this resort to military action the conclusion has been suggested that the desire of the French metallurgical industry to obtain an assured fuel supply was at most only a contributory factor; that the occupation of the Ruhr was primarily a desperate attempt on the part of France to find a solution for the double problem of national solvency and national security; and that the real cause in so far as it was economic, was rooted in the impossible situation created by the reparation clauses of the Treaty of Versailles.

Probably the most important effects of the occupation have been psychological and political. They are therefore imponderable. Economically, the effects of the whole operation might be compared to those of a prolonged general strike extending throughout the greater part of the huge industrial organization of western Germany. And from this point of view the occupation of the Ruhr resulted in an enormous loss to Europe as a whole. Whether the occupation was necessary in order to break the

deadlock in European politics will depend upon the point of view of the reader. The author does not conceal his belief that it was not necessary, any more than a resort to war is necessary in the solution of difficult international problems; but there can be no doubt that it served a useful purpose in demonstrating the difficulty of solving economic problems by the application of military force.

Moreover, the deadlock in Europe has been at least partially broken—or rather, the economic side of the European problem has been partially disentangled from the political side. The belief is widespread that a solution of the reparation problem will be gradually worked out according to the plan of the Committee of Experts. Meanwhile some sort of *modus vivendi* will have to be effected as between the Ruhr and Lorraine; for the French iron industry must continue to receive Ruhr coke and the German iron industry will need Lorraine ore. The coal clauses of the Treaty of Versailles do not expire until January 10, 1930, and France, Italy, Belgium, and Luxemburg will have the right in the meantime to receive from Germany such quantities of coal and coke as the Reparation Commission may from time to time determine. For nearly five years at least,¹ the Commission will continue to exercise a large measure of control over the development of the coal and iron industry in western Europe. That

¹ Perhaps for a much longer period, since Germany has agreed in the Protocol of London (August, 1924), under certain conditions to extend her obligation to deliver coal and coke.

control, however, extends only to the matter of providing fuel for iron and steel production. The important problem of markets for iron and steel products will have to be solved by the nations directly concerned.

With the beginning of the year 1925, the temporary provisions of the Treaty of Versailles, whereby the iron and steel industry of Lorraine has been assured of unrestricted access to its former markets in Germany, have automatically expired. They must be superseded by some sort of new agreement. Otherwise the high protective tariffs of both Germany and France will become operative and the Ruhr-Lorraine system will be still more disastrously disrupted than before. Present indications are that nothing more than a limited and temporary arrangement can be hoped for, and that a definitive solution of the problem of markets can be worked out only as an integral part of the solution of the larger problem.

There are, therefore, two phases of the Ruhr-Lorraine industrial problem: first, that of the supply of raw materials, or the problem of production; and second, that of markets, or the problem of distribution; and both are largely dominated by the question of fuel supply. The two phases cannot, indeed, be treated separately; they are so closely interrelated that they must be considered simultaneously. Both, moreover, are related to the reparation question, and the Ruhr-Lorraine problem as a whole

is for the present bound up with the problem of military security.

The present chapter, therefore, is devoted primarily to a statement of the problem as it exists today, first from the French, then from the German, and finally from the international, point of view. As a preliminary to such a statement, however, it will be necessary to outline the post-war economic and legal status of the iron and steel industry in what was formerly German Lorraine. With the various elements of the problem thus presented, the concluding chapter will be devoted to discussion and analysis of the alternative methods that may be applied in seeking a solution.

I. THE NEW STATUS IN LORRAINE

When Alsace and Lorraine were returned to France at the end of the war all property in the ceded provinces automatically became French in the same manner that it had previously been German. That which had been owned by the native population or by foreigners other than the nationals of the Central Powers suffered no change of individual ownership; but all property formerly owned by the German Government or by German nationals was taken over by the French Government, with the understanding that it was to be liquidated and the proceeds credited to Germany on the reparation account. Thus all the iron mines and the iron and steel plants in Lorraine désannexée, with the excep-

tion of those of the De Wendel Company and a few smaller enterprises owned by mixed French, Belgian and Luxemburgian firms, became the property of the French state.

The metallurgical concerns of Lorraine were annexed to the French iron and steel industry. The transfer was accomplished by the sale on the part of the French government of the former German holdings to five selected groups of firms composing the bulk of the metallurgical industry of France. In disposing of the concessions for iron mining some attempts were made to redistribute certain parcels of land so as to improve the general technical organization of the larger concerns.

Since the concerns operating in Lorraine were few in number, it will be convenient to include a list of them together with the French groups to which they were sold.²

(1) The mines and metallurgical plants of the Roehlingische Eisen ú Stahlwerke at Thionville were sold to a consortium known as the Société Lorraine Minière et Métallurgique, composed of six French and two Belgian firms—among others, the Aciéries de Longwy, which had been damaged by the war, and the Hotchkiss concern.

(2) The properties of the Gebrüder Stumm, in the Uckange region, were sold to the Société des Aciéries du Nord et de Lorraine, composed of the firms

²Laufenburger, *L'Industrie Sidérurgique . . .*, p. 136. See also Appendix C of this book.

operating in the north and east of France as well as certain new firms of the west.

(3) The extensive holdings of the Gelsenkirchener Bergwerks A. G. and the Lothringen Hüttenverein, —a Klockner concern largely interested by ownership in the Fentscher (Belgian) and the Sambre et Moselle (mixed) firms,—comprising mines, blast furnaces and steel plants at Audun le Tiche and Knutange (region of Aumetz-Friede), were sold to a consortium known as the “Schneider—De Wendel” group, composed of the Creusot, les Etablissements de Wendel, les Forges de Châtillon-Commentry, and others. These firms, together with those of the fourth group are the most important metallurgical concerns in France.

(4) The mines and plants of the Rombacher Hüttenwerke, the Dillinger Hüttenwerke A. G., and those of the Rumelange-St. Ingbert and the Deutsch-Luxemburg Bergwerks A. G. at Rombach and Ottange were turned over to a group headed by the Société de la Marine Homécourt, composed principally of those firms which had been damaged by the war.

(5) The extensive mining concessions and the large iron and steel plants of the Thyssen company at Hagondange were turned over to the Union des Consommateurs de Produits Métallurgiques, a group composed exclusively of consumers of iron and steel, primarily manufacturing concerns turning out finished products. Nearly 400 firms participated in

the organization, which was designed to function as a co-operative enterprise.

Along with the De Wendel Company, whose holdings were considerably expanded by participation in the Schneider—De Wendel group, the other plants in Lorraine owned by French, Belgian and Luxemburgian firms, retained their pre-war identity. But the bulk of the iron and steel producing equipment in the recovered provinces was taken over bodily by the French metallurgical industry.

In this wholesale transfer the integrated character of the firms has been largely destroyed. Integration was replaced by what Laufenburger³ has defined as concentration, or the mere grouping together of similar enterprises rather than the various stages of production. In reality, the Lorraine plants were merely annexed to the French firms, which proceeded to conduct them as subsidiary concerns, without participation in the management of the enlarged organization.⁴

Every iron and steel plant in Lorraine désannexée, with the exception of the two Saar concerns (the Roechling and the Dillinger), had previously owned coal mines in the Ruhr or had been an integral part of some concern that did. After liquidation only the De Wendel Company retained the ownership of their Ruhr properties, and these were separated from the iron and steel plants by the new Franco-German

³ *Ibid.*, p. 139.

⁴ *Ibid.*, pp. 179-81.

frontier. Thus the integration "downward" was disrupted by the loss of control of the fuel supply. Even the coal mines in Lorraine (except those of the De Wendel Company), were turned over to a group of French collieries rather than to the metallurgical concerns. The French groups taking over the Lorraine plants have for the most part never been integrated with coal mines, and the new status of the industry as a whole is therefore much less favorable in this respect than the old.

In the matter of integration "upward," or in the direction of finished products, the new situation is likewise inferior to the old. With the exception of the fifth group, the French firms taking over the Lorraine plants are for the most part integrated upward to a certain extent, but their equipment for turning out finished products is designed merely to utilize a part of their former output of pig iron and crude steel. Consequently, they are now in a position to produce much larger quantities of crude or half-finished material than they can consume.

Theoretically, the fifth group, composed of consumers of crude and half-products, should form with the Hagondange plant an ideal integrated organization; but according to Laufenburger⁵ the participating enterprises are so varied in size and kind that the operation of the Hagondange works has been seriously hampered by lack of standardization.

⁵ *Ibid.*, pp. 173-5. Laufenburger criticizes severely the manner in which the liquidation and transfer of the property in Lorraine was carried out. See Appendix D, p. 310 of this book.

Integration "at a distance" has been at least temporarily re-established in the case of the three firms (the Roechling, the Dillinger and the Gebrüder Stumm) which had previously owned only blast furnaces in Lorraine, with steel plants in the Saar region, through the purchase by the new French groups of a controlling interest in the Saar works. In addition, the two blast furnace plants at Audun-le-Tiche (Gelsenkirchener concern) and Ottange (Deutsch-Luxemburg concern) have retained their connection with the steel plants of the same firms operating in Luxemburg. But generally speaking the integration that has been maintained is of a limited and partial nature.

Taking the iron and steel industry in Lorraine désannexée as a whole, the new situation as regards integration may be summarized as follows: Only the De Wendel Company is theoretically as well situated as before the war; and even in this case the success of the integration downward depends on a Franco-German agreement with respect to the fuel supply. All the other firms, accounting for 3,171,100 tons of the 3,869,900 tons of pig iron produced in 1913 ⁶ have lost all connection with their coal supply in Westphalia. Three enterprises (Rom-bach, Knutange and Hagondange) are integrated upward to the extent of being equipped with steel plants. Together with those of the De Wendel Company and of the smaller firms of mixed ownership,

⁶ See Appendix C.

these plants accounted for the whole of the steel output of 2,286,100 tons in 1913. Five blast furnace plants (Thionville, Uckange, Rédange, Audun-le-Tiche and Ottange) are integrated at a distance with steel plants in the Saar and Luxemburg.

But the bulk of the industry is equipped only for the production of crude or half-finished products, which represent merely an addition to the supply of raw materials which were already being produced by the French blast furnaces and steel works before the acquisition of the extensive equipment in Lorraine désannexée. In very general terms the new position of the French iron and steel industry may be defined by the statement that France has expanded the elementary stages of her industry to nearly double the pre-war capacity; that even this is compromised by the lack of an assured fuel supply; and finally, that along with the acquisition of only a part of a highly integrated industry in Lorraine, France has acquired an exceedingly complex and baffling politico-economic problem.⁷

⁷ An illuminating discussion of the French metallurgical problem in relation to the activities of the Comité des Forges de France will be found in a series of articles by M. Francis Delaisi published in the *Manchester Guardian Commercial*, European Reconstruction Sections 15 and 16, of May 31 and July 12, 1923, and in the regular issues of that journal for Aug. 16, and Nov. 1, 1923. In the issue of Oct. 25, 1923, M. Robert Pinot, Vice-President of the Comité des Forges replies to certain criticisms of M. Delaisi; but the whole series including M. Pinot's article, presents an interesting picture of both the problem of production and that of markets.

II. THE PROBLEM FROM THE FRENCH POINT OF VIEW

Of all the complex elements in the politico-economic situation of post-war Europe, the Ruhr-Lorraine industrial problem, with its far-reaching economic and political implications, is for France one of the most urgently and vitally important. From the French point of view, the problem is not merely economic. There is a political phase, which is so closely interrelated that it has been impossible thus far to deal with the economic problem alone, and no small part of the difficulty of finding a solution has derived from this fact. Since the political phase is largely contingent upon economic developments, however, it will be convenient to deal first with the economic side of the problem. Once the significance of this is fully understood, the political implications will become apparent; and only a simple statement will be required of the relation of the Ruhr-Lorraine industrial problem to the military security of France.

For France, the assurance of an adequate fuel supply is in the long run the crux of the economic problem. This is a dominant factor in both production and distribution. It is not merely the matter of a supply of coke for the Lorraine blast furnaces that is involved here, but the problem of securing enough additional fuel to permit France to develop an industrial organization commensurate with her

potential output of crude iron and steel. Assured of such a fuel supply, France might eventually find the problem of markets to a large extent solved by the increased consuming capacity of her own population.

Even before the war France depended upon imports for approximately one-third of her coal and more than half of her coke supply.⁸ Since the return of Alsace-Lorraine, the situation in this respect has become considerably worse instead of better, owing to the fact that the recovered provinces have been accustomed to consume nearly three times as much coal and coke as they produced.⁹ The possession of the coal mines of the Saar serves at least temporarily to compensate the increased consuming capacity; but even so, France is very largely dependent upon imported fuel.

In the matter of an adequate coke supply, due to the poor coking quality of the Saar coal and the fact that practically the entire coke output is consumed in the Saar region itself, the dependence upon imports has been increased from one-half to nearly three-fourths of the total consumption. Even though France should obtain permanent possession of the Saar mines, therefore, her new position with respect to a supply of coke would be relatively less favorable than before the war, although her general fuel supply would be approximately the same.

⁸ See table on p. 69, Chapter III.

⁹ The production of Alsace-Lorraine in 1913 was 3,986,000 tons of coal; the consumption was approximately 10,000,000 (of coal and of coke in coal equivalent.)

But the assurance of as much coal and coke as the present territory of France consumed before the war would not solve the problem. France must have a great deal more than this if she is to derive the full benefit from her iron and steel industry. Unless she plans to export in crude or half-finished form the bulk of her output she will find it necessary to effect an enormous expansion of her facilities for turning out finished products; and this will be impossible without a corresponding increase in the general fuel supply.

Where can France secure her indispensable requirements of fuel? Her problem really consists, first, in obtaining the assurance of as much coal and coke as her present territory consumed before the war, and second, in providing additional fuel for industrial purposes in general. Now there are only two great coal producing regions in western Europe: Great Britain and the Ruhr district. The British mines are from two to three times as far removed from the Lorraine region as those in the Ruhr, although the western part of France is somewhat nearer the British ports and consequently more accessible to the supply of British coal.

The assumption seems justified, therefore, that on purely economic grounds France must secure additional fuel for her eastern districts contiguous to the Lorraine region from the Ruhr, and meet the requirements of her western provinces from Great Britain. This arrangement would leave the central

and northern regions to be supplied by the French collieries. In general terms, such was the arrangement in existence before the war. The problem of France is not only to re-establish completely the former system, but greatly to expand it.

The Lorraine region must inevitably continue to receive the bulk of its fuel supply from the Ruhr. It is a matter of sheer economic necessity. For the present the need is chiefly for coke, although eventually the Lorraine concerns will probably prefer to build coking plants of their own and import coking coal.¹⁰ But whether the need be for coke or for coking coal, the only really adequate source of supply that will be economically available is the Ruhr. Coke imports from Great Britain are out of the question because of the necessity of trans-shipment;¹¹ while the importation of coal from sources two or three times farther away than the Ruhr would as a permanent arrangement make it practically impossible for the Lorraine iron and steel industry to compete with that of Germany and Great Britain.

In so far as France can supply her fuel needs from Great Britain, there seems to be no particular

¹⁰ The advantages of such an arrangement are manifold. For example, coal is more readily obtainable and efficiently transportable than coke; the by-products of the coking process, the heat and power from the gases, etc., are of great value. For an excellent discussion of this question, see Laufenburger, *L'Industrie Sidérurgique* . . . , p. 153. See also Appendix D of this book.

¹¹ Attempts were made in the early part of the year 1923 to make up for the loss of coke from the Ruhr by imports from Great Britain and the United States; but the experiment was highly unsatisfactory owing to the fact that the coke was so badly broken in shipment as to be almost worthless.

problem involved at present. British exporters are apparently willing to go on indefinitely shipping out of the country large quantities of a strictly limited supply of coal.¹² From the French point of view, therefore, the most urgent economic problem is that of effecting a permanent arrangement whereby an adequate supply of German coal will at all times be available. The solution provided by the reparation clauses of the Treaty of Versailles and the arrangement made at London, (Aug. 16, 1924) in connection with the Dawes plan is but temporary and partial. If it is to rest on a firm economic foundation, the French metallurgical industry must have an arrangement more stable and less subject to the vagaries of politics.

For the present the problem of markets is of equal urgency with that of the fuel supply. The production of pig iron in 1913 in the territory which is now incorporated in France amounted to 9,071,000 tons, while the consumption in the same territory amounted to 7,341,000 tons.¹³ But the total net consumption of iron and steel products of all kinds within her enlarged frontiers amounted to only 5,130,000 tons. Practically the whole of the net exports were in the form either of pig iron, scrap,

¹²The current English trade journals are full of reports of the efforts of the coal industry to retain and expand its foreign markets.

¹³Production *plus* imports *minus* exports. Imports and exports (except from and to France) of Alsace-Lorraine compiled from German Imperial Traffic Statistics. See note to table on p. 71, Chap. III.

or crude or half-finished steel.¹⁴ The capacity of France to produce crude iron, therefore, has been nearly doubled, while her consuming capacity for iron and steel products has been only slightly increased.¹⁵

Eventually, as pointed out above, the assurance of an adequate fuel supply might be expected to solve a part of the problem of markets, by stimulating industrial development and thus increasing the consuming capacity of France. But the realization of this eventually will be a matter of years, perhaps a generation, even under the most favorable conditions. Hitherto no serious difficulty has been encountered in disposing of the crude iron and steel output, largely because (1) the production has been much less than the capacity and (2) the former markets in Germany of the Lorraine plants have been accessible through the special provisions of the

¹⁴ An accurate statement is not possible because of the lack of more complete classification in the French foreign trade figures and the approximate character of the compilations from the German Traffic Statistics; but it may be safely asserted that both France and Alsace-Lorraine in 1913 imported more finished iron and steel products than they exported.

¹⁵ Monsieur Robert Pinot, Vice-President of the Comité des Forges de France, in an article published in the *Manchester Guardian Commercial* of Oct. 25, 1923, p. 445, declared:

“As a result of the Peace Treaty, handing back Alsace-Lorraine to the mother country, and without any act of megalomania on her part, French metallurgy has experienced *overnight* [italics M. Pinot’s] the doubling of her capacity of production, which rose from five to eleven million tons [M. Pinot evidently includes in the new productive capacity of France the output of the Saar], while there was no perceptible increase in France’s capacity of consumption, as a consequence of the reuniting of those two provinces.”

Treaty of Versailles. Beginning in 1924, however, production has been rapidly increased; ¹⁶ and since the special provisions for the free entry into Germany of the products of Alsace-Lorraine expired on January 10, 1925, the problem of markets has begun to assume serious proportions.

Almost as much as in the matter of fuel supply, France is dependent upon Germany for markets. Of the total net exports of present France (pig iron, scrap and iron and steel of all kinds), amounting in 1913 to 3,941,000 tons, about 2,253,000 tons went to present Germany (including the Saar territory).¹⁷ Needless to say, the bulk of this iron and steel originated in Lorraine désannexée and did not in 1913 represent imports into Germany. Almost the whole of it consisted of pig iron (1,569,000 tons) and crude or semi-finished steel, shipped to the Ruhr and Rhineland, the Saar, and other parts of Germany for transformation into finished products.

Since the war the dependence upon German markets, in spite of the considerably reduced output, has still been very great. The following table shows the exports of the three principal categories of iron

¹⁶ In 1923 France produced 5,432,000 tons of pig iron and 5,110,000 tons of steel. In 1924 she produced 7,656,700 tons of pig iron and 6,907,200 tons of steel. (*Bulletin de la Statistique Générale de la France*, December, 1923, and December, 1924.)

¹⁷ For the method of arriving at this figure, see note (a) on p. 231 of this chapter. It should be noted that the figure of 2,253,000 tons is for net exports (exports less imports) from present France to present Germany. The total exports amounted to 2,673,000 tons, 420,000 tons being imported by present France from present Germany.

and steel sold abroad in the post-war years, together with the proportion of these that went to Germany and the Saar district.

PRINCIPAL EXPORTS OF FRENCH IRON AND STEEL.*
(Thousands of Metric Tons)

	1920	1921	1922	1923	1924
<i>Pig Iron, including alloys</i>					
Total Exports	296.0	670.5	730.2	613.8	784.0
To Germany	19.9	73.6	204.8	22.5	123.6
To Saar Territory....	25.0	62.7	146.6	113.1	127.1
<i>Blooms, billets, and bars (half-products)</i>					
Total Exports	344.3	606.3	810.8	913.5	1,310.9
To Germany	7.6	61.2	305.1	110.2	183.2
To Saar Territory....	17.0	26.6	18.0	34.7	35.5
<i>Scrap</i>					
Total Exports	427.1	580.2	976.9	506.5	445.1
To Germany	43.7	151.5	180.6	^a	^a
To Saar Territory....	25.7	42.2	125.4	^a	^a

* Figures for 1920-22 from *Tableau Général du Commerce et de Navigation*, 1920, pp. 462-8; 1921, pp. 462-8; 1922, pp. 462-8. For 1923 and 1924 from *Commerce Reports* (U. S. Department of Commerce) March 6, 1925, p. 620. It should be added that the bulk of the remainder of France's iron and steel exports went to Belgium and Great Britain.

^a Data not available.

Until such time as France is able to build up her own consuming capacity for iron and steel, to dispense with the German market would be almost as difficult as to become independent of the German fuel supply. The other great iron producing and consuming nations (the United States and Great Britain) since the war have considerably expanded their capacity to produce steel. Germany alone,

among the important consumers of iron and steel, has at present a productive capacity considerably less than before the war. But Germany, even within her present frontiers and exclusive of the Saar region, remains a net exporter of metallurgical products.

Moreover, Germany's obligation to make large reparation payments makes it indispensable for her either to increase enormously her exports or reduce her imports. In the whole problem of markets, in fact, the reparation question is a serious hindrance. France is faced with the dilemma of being obliged to receive increased quantities of German goods without tangible payment, and at the same time to find markets in Germany for a large part of her surplus iron and steel production. Preposterous as the idea may seem, the problem of markets for the French iron and steel industry could be much more readily solved if France were paying reparation to Germany.

The problem of security is bound up with the economic inter-dependence of the Ruhr and Lorraine. To many Frenchmen there is involved here a dilemma more serious than in the purely economic problem of raw materials and markets. In order to secure from Germany coal and coke, on the one hand, and the privilege of selling iron and steel in a relatively free German market, on the other, France must inevitably make some economic concessions. Whether such concessions consist in supply-

ing increased quantities of iron ore to the German metallurgical industry or in throwing open the French markets to that industry, the ultimate outcome can only be to strengthen the economic position of Germany. Add to this the inescapable fact that Germany, both by her possession of enormous fuel resources and by her greater and more prolific population, is potentially the stronger economic and military power, and the dilemma of France becomes only the more apparent.

Any conceivable arrangement that France can make—short of a resort to war—is bound to afford at last some aid to Germany in the reconstruction and the expansion of the vast industrial organization that characterized the German Empire of 1914. French statesmen know that such an industrial organization, consisting of equipment for turning out enormous quantities of all manner of iron and steel products, and above all, of all manner of chemical products, can be in a relatively brief period transformed into a machine for waging war. In the case of such an industrial nation, which cannot be prevented from building as many commercial air planes as it pleases, genuine material disarmament is an impossible dream; and the statesmen of France, however genuinely desirous they may be of maintaining the peace of the world, know it.

They know, moreover, that the one hope of a non-military solution of the problem of security lies in moral disarmament—the removal of the causes and

incentives of war, and above all the elimination of national resentment. But even the most liberal Frenchman probably realizes that, what with the history of the reparation question and the struggle in the Ruhr, and whatever the justification on both sides, it would be hardly reasonable to hope for genuine moral disarmament in Germany now. Almost the whole French nation, therefore, irrespective of fundamental political conceptions, seems to be firmly convinced that for the present something in the nature of a military guarantee of security must precede or at least accompany a solution of the economic problem.

The security problem, of course, is in many respects of wider scope than the essentially economic problem arising out of the disruption of the Ruhr-Lorraine industrial system. It is a basic element in the vast complex of post-war international relations in Europe, but it is so intimately bound up with the economic elements of the post-war European situation that it cannot be ignored in searching for a solution of the Ruhr-Lorraine industrial problem.

III. THE PROBLEM FROM THE GERMAN POINT OF VIEW

With the substitution of the words "iron ore" for "coal and coke," much that has been said of the Ruhr-Lorraine industrial problem from the French point of view might be repeated in a statement of the problem from the German point of view, but with this important difference:—except for the

obligation to make large reparation payments (and from what is probably a superficial view of the present situation), none of the elements is of such immediate and vital importance to Germany as to France. Moreover, certain aspects of the problem are of especial significance in the fundamental economic situation of Germany, and are, therefore, worthy of separate enumeration.

Germany's most urgent economic problem is the re-establishment of her foreign trade. Iron and steel, of course, made up only a part, although a very important part,¹⁸ of her total exports before the war; but it is no exaggeration to say that the whole industrial organization of the nation was intimately bound up with the iron and steel industry. Germany's capacity to produce and export, not only iron and steel products, but almost every conceivable kind of manufactured goods, depends chiefly upon the output of coal, on the one hand, and of iron and steel, on the other.

Since the war, due largely to the loss of iron and steel producing territory, both the output and the net exports have been enormously reduced. The accompanying table (p. 230) will show the relative position of the old and new Germany in this respect.

It will be observed that present Germany, on the basis of her foreign trade in 1913, has become a

¹⁸ In 1913 the total exports amounted to 10,097,200,000 marks, of which the exports of iron and steel products of all kinds (including machinery) made up 2,365,000,000 marks (from *Statistisches Jahrbuch für d. D. Reichs* 1921/2, p. 221).

potential net importer of pig iron. She remains a potential net exporter of other iron and steel products, but in a much lesser degree than the German Customs Union of 1913. The total net exports of iron and steel of all kinds in that year amounted to 6,609,100 tons, whereas the net exports of present Germany in the same year amounted to only 120,000 tons, on account of the large quantity of pig iron and crude steel received from the lost territories. Since the war the total imports have been greatly increased while the exports have been enormously decreased with respect to the pre-war Empire, although in relation to her present territory both the imports and exports are far short of the figures for 1913.

Two factors in the present economic situation of Germany combine to make it imperative for her to effect a large increase in both her production and her exports of iron and steel: (1) the necessity of paying for a much greater volume of imports of food and raw materials than she has been receiving since the war, in order to re-establish the economic organization required for the maintenance of her industrial population;¹⁹ and (2) the obligation to make large reparation payments by means of a surplus of exports over imports.²⁰

The industrial population of Germany since the

¹⁹ For a discussion of Germany's foreign trade requirements, see Moulton and McGuire, *Germany's Capacity to Pay*, Chap. IV.

²⁰ See Report of the Dawes Committee.

GERMANY'S PRODUCTION AND FOREIGN TRADE IN IRON AND STEEL.*

(Frontiers as of the given years)

Thousands of Metric Tons.

	1913		1920	1921	1922	1923	1924
	Pre-war Customs Union	Present Territory ^a (Excluding Saar)					
<i>Pig Iron</i>							
Production	19,312.0	10,916	7,043.6	7,845.3	9,395.7	4,936.3	.....
Imports ^b	126.4	2,200	221.7	384.7	951.4	488.4	311.9
Production + Imports.....	19,438.4	13,116	7,265.3	8,230.0	10,347.1	5,424.7	.....
Exports ^b	856.5	910	125.9	282.6	270.8	473.6	464.8
Consumption	18,581.9	12,206	7,139.4	7,947.4	10,076.3	4,951.1	.....
<i>Steel and Iron and Steel Production</i>							
Production (assumed equivalent to pig iron consumption) ^c	18,581.9	12,206	7,139.4	7,947.4	10,076.3	4,951.1	.....
Imports	595.5	4,540	205.8	552.6	1,570.1	1,454.7	1,203.1
Production + Imports.....	19,186.4	16,746	7,345.2	8,500.0	11,646.4	6,405.8	.....
Exports	6,484.5	5,950	2,300.7	2,719.5	3,003.1	1,660.3	1,939.3
Consumption	12,702.9	10,796	5,044.5	5,780.5	8,643.3	4,745.5	.....
Net Exports	6,609.1	120	1,999.1	2,064.8	752.4	190.8	889.1

* Figures for post-war pig iron output from *Stahl und Eisen*, Feb. 12, 1925, p. 241; for imports and exports 1920-1922 from *Statistik d. D. Reich* Bund 310, Hefte I, and for 1923 and 1924 from *Wirtschaft und Statistik* 4 Jahrg. No. 3 and 5 Jahrg. No. 3 (it is stated that on account of the Ruhr invasion the figures are incomplete). Exports for 1921 are only published for the period May-December, but the figures given above are the estimated totals for the year on the basis of the average for the eight months referred to.

^a Figures for present territory of Germany compiled from German Imperial Traffic Statistics. The method of computation is as follows: Imports of present Germany *equal* Imports of German Customs Union *minus* Imports that went to lost territory, the Saar and Luxembourg *plus* shipments from lost territory, the Saar and Luxembourg to present Germany. Exports of present Germany *equal* Exports of Customs Union *minus* Exports that went from the lost territories, the Saar and Luxembourg *plus* shipments of present Germany to the lost territories, the Saar and Luxembourg.

^b In the imports and exports of pig iron since the war scrap is included.

^c In reality the production of steel since the war has been much greater than the consumption of pig iron, on account of the enormous quantities of scrap (largely dismantled war materials) consumed. See table on p. 17, Chapter I. The above figures are merely intended to show the output made from the current production of pig iron. According to Reichert, Executive Secretary of the Verein Deutscher Eisen- u. Stahl Industrieller (*Stahl und Eisen*, Jan. 1, 1925, pp. 11-6), the iron and steel consumption in Germany since the war has been as follows: 1920, 7,666,500 tons; 1921, 8,906,300 tons; 1922, 11,744,400 tons; 1923, 6,946,100 tons; 1924 (first nine months), 7,200,000 tons.

war, notwithstanding the loss of territory, is not only relatively but absolutely greater than in 1913.²¹ On the other hand, the domestic production of food and raw materials—particularly of coal and iron ore—has been greatly reduced. The conclusion seems justified, therefore, that present Germany, in order to maintain her industrial population, must regain a general economic position comparable to that of pre-war Germany; that in order to accomplish this she must both produce and export quantities of iron and steel, comparable, not with those of her present territory before the war, but with the production and exports of the pre-war German Empire;²² and finally, that if effective reparation payments are to be made, Germany's general capacity to produce and export goods must be increased still further.

From a superficial view of the present situation, Germany can afford to play a waiting game. Her dependence upon France, both in the matter of raw materials and markets, is undoubtedly less urgent than the dependence of France upon her. Many

²¹In 1913 the total population of the German Empire was 67,000,000 and the number actually employed in industry 7,386,173. In 1922 the total population was 62,000,000 and the number actually employed in industry was 8,215,622. (*Statistisches Jahrbuch für das Deutsche Reich*, 1923, p. 75.)

²²This statement may perhaps be challenged on the ground that Germany might increase her exports of goods other than iron and steel; but it is difficult to see what she could export in quantities sufficient to take the place of her pre-war iron and steel trade. It is true, of course, that the problem might be partially solved by the emigration of her surplus industrial population or by its reabsorption in the agricultural population—or by letting it die of undernourishment, as seems to be the present method.

Germans, therefore, are probably persuaded that they can afford to wait until economic pressure has forced France to offer better terms than she is ready to grant at present.

It is true that Germany must import large quantities of iron ore, but for the present at least she seems to be able to supply the greater part of her needs from sources other than Lorraine, and with ore of a much higher quality. The advantage inherent in her possession of enormous resources of good coal is such as to enable her to a considerable extent to choose her own ore supply. Since the war, she has in fact been doing this, although still receiving considerable quantities from Lorraine.²³

However, the total quantity of iron ore available for consumption in Germany has been considerably less than was consumed in the same territory before the war, although it would be impossible to determine whether imports from Sweden and Spain could not have been increased. But inasmuch as Germany has at all times been able to purchase much larger quantities from Lorraine than she has actually received,²⁴ the conclusion remains valid that from the present point of view of her metallurgical industry, Germany can to a large extent dispense with the Lorraine ores. But the best evidence that this point

²³ See table on p. 162, Chapter VI.

²⁴ This statement might possibly be challenged by certain German iron masters on the ground that the price was too high; but an examination of the actual quotations would seem to dispose of the argument. See the files of the *Revue de l'Industrie Minière*, *Stahl und Eisen*, and *Glückauf*, for current prices.

of view is in reality superficial—very probably maintained for bargaining purposes with France—lies in the fundamental economic requirements of Germany. She must greatly increase her iron and steel output and her general capacity to produce and export goods; and in order to do so she must have much larger quantities of iron ore than she can reasonably hope to produce at home or to import from Sweden and Spain or any other source economically available.

In the matter of markets Germany is less dependent upon France than for her supply of iron ore. It is true that present Germany exported to present France over 500,000 tons of iron and steel (for the most part finished products) in 1913, but this quantity represented only about 7 per cent of her total exports; whereas the exports of present France to present Germany in the same year represented 55 per cent of the total exports. Moreover, the possibility of making regular reparation payments—after the present practice of paying with borrowed funds runs its course—will depend upon Germany's ability to expand her exports; and the Allies, if they really intend to go on collecting reparation, will be obliged to aid materially in solving the problem of markets by increasing their own purchases of German goods.

There is also a political phase of the problem from the German point of view. If it were possible to evaluate all of the elements that enter into the Ruhr-Lorraine industrial problem, it is probable that

the political phase would be found to be of very considerable importance in determining the present attitude of Germany. It goes without saying, that just as a solution of the economic problem involving participation by both countries would necessarily add to the potential military strength of the one, it would also add to the potential strength of the other.

The problem of military security is therefore bi-lateral, and it is made all the more urgent for Germany by the Allied occupation of the Rhineland. On the other hand, the German population is not only a third larger than the French, but it increases much faster, so that as far as security from attack by France alone is concerned, it might be argued that in the long run Germany has little cause for uneasiness.

Just as in the French view of the situation, there are, of course, other elements of a political nature which tend to complicate the problem from the German point of view, such as the political and economic relations of both countries to Poland and the Little Entente; but these are aspects of the wider European problem that do not fall within the scope of the present study. Moreover, the foregoing discussion is not designed to give more than a bare outline of the chief economic problems with which both Germany and France are confronted. Enough has been said to show, however, that the Ruhr-Lorraine industrial problem, when considered from separate French and German points of view, con-

tains many of the elements of a complete deadlock. In order to obtain a more comprehensive understanding of this aspect of the situation, therefore, it will be necessary to state the problem from a somewhat wider point of view.

IV. THE INTERNATIONAL PROBLEM

It was asserted in the introduction to this book that the Ruhr-Lorraine problem is not only more than a French problem or a German problem but more than a Franco-German problem. We have seen, moreover, that any solution which would fully satisfy the economic requirements of one of the two nations principally interested would exclude a solution satisfactory to the other. Germany would be unwilling to furnish unlimited quantities of coal and coke to France and at the same time permit the unlimited marketing in Germany of French iron and steel products made with the aid of the same coal and coke, without some sort of *quid pro quo*. On the other hand, France would not consent to supply all the iron ore that Germany might require and open her own markets to the unrestricted sale of German iron and steel without receiving some reciprocal advantage in return.

Confronted with the dilemma of being unable to render themselves completely independent of each other, on the one hand, and the impossibility of obtaining complete satisfaction of their respective economic requirements, on the other, France and

Germany will probably find it necessary to effect some sort of compromise. The question which is relevant to the actuality of the situation, therefore, is not whether the two countries will arrive at a working arrangement of some sort, but what kind of arrangement they will make.

It is at least within the bounds of possibility that they might each treat the problem from a purely nationalistic point of view and arrive at a temporary or make-shift solution that would run counter to the interests of Europe as a whole and prevent the Ruhr-Lorraine system from performing its normal functions in the economic structure of the world. Such a solution, of course, might be expected to redound to the ultimate disadvantage of the two countries themselves; but where extreme nationalistic tendencies are at work it is not always possible to obtain adequate consideration either for the long-run consequences of any particular arrangement or for the best interests of more than the individual countries concerned.

The essence of the international problem is to resume the pre-war scale of economic operations. In a sense it is the problem of re-establishing the economic *status quo ante bellum*, although in practice it is at once somewhat less and somewhat more than this. What is required is not merely a return to pre-war conditions of the production and distribution of goods, but the recrudescence of the pre-war tendency towards economic internationalism as well.

Ultimately that tendency might be expected to result in the complete disappearance of economic frontiers from the territory comprising the Ruhr-Lorraine industrial system and the gradual suppression of all the economic frontiers in Europe.

However, it is not intended to close this discussion with a repetition of the familiar arguments for free trade or for a "United States of Europe," but rather to call attention to the necessity of re-establishing, *immediately*, the production and distribution of goods on somewhat the same scale and in the same territories as existed in Europe before the war.

In spite of the war losses, the total population of Europe has undergone no very great change since 1913.²⁵ Moreover, there has been no considerable migration of people from one part of Europe to another, so that the population of any particular area, irrespective of what alterations may have taken place in national frontiers, has not been materially changed. The economic organization of Europe before the war, with respect to both the production and distribution of goods, may be considered to have been approximately sufficient to support the European population *as it was and is*, and *where it was and is*, at the pre-war standard of living.²⁶ If that

²⁵ According to figures taken from *Statistical Abstract of the United States*, 1914, p. 688, and 1922, p. 727 (as compiled from official reports of the various Governments—including the whole of Russia and excluding the whole of Turkey for both years), the population of Europe was 486,000,000 in 1913 and 475,000,000 in 1922. The difference is approximately 2.3 per cent.

²⁶ There is no intention here to deal with such controversial matters as the population question, the so-called law of diminish-

standard of living, which most observers will agree was not excessively high, is to be maintained, the production and distribution of an equivalent volume of consumable goods must also be maintained. Moreover, the production must take place in the same areas as before the war, and a similar rate of interchange of commodities among the different areas of Europe and between Europe and the rest of the world must be re-established.

There is probably no need to emphasize further the part that must be played by the Ruhr-Lorraine industrial system in re-establishing the pre-war scale of economic operations in Europe. That system must supply the bulk of both the motive force and the machinery necessary for the re-establishment of production. To satisfy the fundamental economic requirements, therefore, it must be reconstructed and permitted to function on a scale comparable to that which existed before the war. Whether this can be effectively realized in practice will depend very largely upon the methods that are applied in seeking a solution of the problem.

ing returns, the possibility of technical progress resulting in greater intensity of production, and the like. The general statement is only intended to convey a broad outline of the situation.

CHAPTER IX

THE ALTERNATIVES

In general terms there are three alternative methods that may be employed in seeking a solution of the Ruhr-Lorraine industrial problem. These are, first, the way of relative independence, or the continuation of the present tendency of France and Germany (as well as the Belgian-Luxemburgian Customs Union) to develop their respective metallurgical industries with a view to as complete economic independence as possible; second, the application of political or military pressure by the governments of the various countries concerned, in the hope of gaining economic advantage; and third, the fullest possible economic co-operation.

This statement of the three methods as alternatives may appear to be somewhat arbitrary, since in practice no one method is likely to be used to the complete exclusion of the other two; indeed, the procedure actually followed since the war may be considered to have been a combination of the first two, with the second largely predominating, while the third has been talked about but never attempted in practice. But it should be understood that reference is made here only to the fundamental principles

which may be uppermost in determining the ultimate solution of the problem.

I. THE WAY OF RELATIVE INDEPENDENCE

A combination of causes, arising for the most part out of the World War, has intensified the tendency of all nations to work towards the maximum degree of economic independence. The opposing tendency, towards economic internationalism, which seems to have been dominant during the years preceding the outbreak of hostilities, has unquestionably received a severe setback. That restrictions on the exchange of commodities among the nations of the world are at once more numerous and more effective than before the war, is a commonplace.

Unless, therefore, there is a considerable change in the present conditions of international trade, Germany and France, the two countries chiefly interested in what was formerly the Ruhr-Lorraine system, may be expected to attempt the development of two separate and distinct metallurgical industries. Their trade with each other both in raw materials and finished products will represent to a large extent a compromise among conflicting interests. Complete independence may be ruled out as impossible, but a determined effort on the part of either or both countries to reduce their interdependence to a minimum will undoubtedly have important consequences for the future of the iron and steel industry in western Europe.

In order to forecast something of the nature of those consequences, it will be necessary to assume a state of affairs that does not for the present exist, namely, the disappearance of the reparation question from the complex of international relations in Europe and the elimination of the political advantage of France and her allies in holding under military occupation a large part of the territory of western Germany. In other words, in order to examine the long-run possibilities of the iron and steel industry in France and Germany in the light of the present tendency towards national independence, it will be necessary to assume that politically (and economically, as far as the reparation question is concerned) the aftermath of the war has been liquidated.

Some exchange between France and Germany of iron ore for fuel seems inevitable. On economic grounds alone Germany would naturally prefer to exchange fuel only for raw materials and food rather than for finished products. Likewise, France might be expected to favor the exchange of iron ore only for raw materials or other imports indispensable to her national economy. In practice, of course, the trade may very well be more complicated; but the need of each country for a commodity possessed in comparative abundance by the other will in all probability result in a system of direct exchanges. On the other hand, it would not be safe to predict as a permanent arrangement large purchases of German

fuel by France in the ordinary course of trade, unless Germany should be *normally* exporting coal. And the same generalization would hold for the purchases of French iron ore by Germany.

It is nevertheless within the bounds of possibility that Germany might be obliged to export fuel in the ordinary course of her foreign commerce. She did so before the war, to the extent of some 20 per cent of her coal output; and she will in all probability find it necessary to resort to every means at her command to increase the total of her exports in order to regain her former position in international trade. The difficulty lies in the fact that her production has been so considerably reduced by her loss of the mines in Upper Silesia that the territory comprising present Germany was in 1913 a net importer of coal rather than a net exporter. However, Germany still has enormous coal reserves, and if confronted with the urgent necessity to do so, she could undoubtedly expand the capacity of her remaining mines and open new ones, and thus regain her former status of a coal exporting country.

France, also, is likely to find it necessary to continue the export of a considerable proportion of her iron ore output, for her potential capacity of production is such that there is little probability of her being able to consume it all. Whatever the future political and economic developments, therefore,—short of the outbreak of another great war,—a certain amount of Franco-German trade in iron ore and

coal and coke seems inevitable. What is of paramount importance in the future of the Ruhr-Lorraine system is the ultimate result of a determined effort on the part of either or both of the two countries to maintain the maximum degree of economic independence.

The transportation ratio of coal and iron ore is likely to play a larger part than formerly. In the event that neither Germany nor France should plan to export raw materials in the ordinary course of their foreign trade, or—what is more likely to be the case—that both countries should endeavor to keep such exports down to a minimum, what might be expected as the normal exchange ratio between coke and iron ore? If transportation should be the controlling factor—and it would inevitably play an important rôle—the exchange ratio would be approximately four tons of coke for five tons of ore. But if the Lorraine concerns should build coking plants of their own they would require coal, and the transportation ratio might then be approximately ton for ton.¹

Let us suppose that such had been the conditions in 1913; that the question of markets and the tendency of the great Ruhr-Lorraine firms to make pig iron or raw steel in Lorraine and ship it to the Ruhr and Rhineland for finishing had not interfered with

¹Iron ore, of course, has a much higher specific gravity than even coal, which is considerably heavier than coke; but the 4-5 ratio is not based entirely on specific gravity, the capacity of the railway cars being a limiting factor.

the transportation ratio for ore and fuel. Since the Lorraine region as a whole (including Luxemburg) received 8,400,000 tons of coke and about 1,000,000 tons of coal from the Ruhr and Rhineland, or the equivalent of 12,200,000 tons of coal,² the Ruhr and Rhineland would have imported at least as much Lorraine ore instead of the 4,778,000 tons actually received in 1913. If the transportation ratio should govern in the future and the Lorraine region should receive as much Ruhr coke as before the war, then the Ruhr and Rhineland would be obliged to increase nearly three-fold their pre-war consumption of Lorraine ore. This, of course, would require a corresponding increase in the ore production of Lorraine, but the resources of the field are so great that no difficulty would be encountered in expanding the output.

From the standpoint of production such an arrangement might work out very well. France would be in a position to produce about as much pig iron as her present territory produced before the war; and Germany, if she continued to receive as much iron ore as before from sources other than Lorraine, would be in a position to produce considerably more than the output of her present territory before the war. The aggregate result would be a considerable increase over the pre-war combined output of both iron ore and pig iron in the territory comprising present France and Germany.

²See table on p. 43, Chap. II.

The economic independence of France is gravely compromised by the double problem of markets and fuel. Present Germany is normally a large consumer of the pig iron and raw steel produced in the Lorraine region, but if she increased very considerably her own production she would not require so much from Lorraine. However, her blast furnace equipment is at present inadequate to consume any greatly increased volume of Lorraine ores without reducing her consumption of the higher grade ores produced within her own territory and imported from Sweden and Spain. Until such time, therefore, as she expands her blast-furnace equipment, she is likely to consume no more Lorraine ore than her present territory consumed before the war. Her requirements for pig iron and raw steel, in so far as her own output is insufficient, she will supply by imports, perhaps from Lorraine and perhaps from Great Britain or some other source, depending upon the price, quality, transportation costs, and the like.

France, on the other hand, even though it be assumed that she is able to secure as much German coal and coke as before the war, will be faced with the necessity, either of obtaining a great deal more fuel than ever before in order to transform her crude iron and steel output into finished products, or of exporting a large part of her output in the crude form; and her chief markets for crude iron and steel are normally in Germany. If she makes shift to obtain enough fuel for transforming her crude mate-

rials into finished products, then she will have to have still greater quantities of fuel in order to build up a general industrial development at home to supply a domestic market for finished iron and steel products; or, handicapped by increased production costs brought about by imported fuel, she will have to compete in the markets of the world against three other great industrial nations—Germany, Great Britain, and the United States—which are bountifully supplied with coal.

It is true that France may be able to mitigate to some extent her dependence upon imported fuel by the development of hydro-electric energy. Indeed, she has been making substantial progress since the war in the utilization of this resource, which is popularly referred to as "white coal." At the end of the year 1924 some 3,000,000 horse-power had been developed, and it is estimated that in 10 years' time this figure will have been increased to 4,500,000 or the equivalent of 24,000,000 tons annually of coal.³ The potential water-power resources of France have been variously estimated as being from 4,700,000⁴ to 9,400,000 horse-power,⁵ the higher figure being approximately equal to the hydro-electric energy

³ *La Journée Industrielle*, Feb. 24, 1925. The figure for the coal equivalent of electrical energy appears to be too high, since in modern practice the production of one horse-power annually requires a little less than four tons of coal.

⁴ *World Atlas of Commercial Geology*, Part II, U. S. Geological Survey, 1921.

⁵ *Bulletin de la Statistique Générale de la France*, January, 1924, p. 184.

actually in use in the United States, where it plays an insignificant rôle in the saving of coal.

This method of augmenting the available supply of power should be utilized to the fullest possible extent, as a matter of course, whether an attempt be made to maintain a high degree of independence of Germany or not; but the real possibility of thus replacing the German fuel supply should not be overestimated. Electrical power, in the present stage of technical development, can not replace coke in large-scale metallurgical production. Moreover, the development of additional hydro-electric energy in France will be increasingly expensive as the more accessible water-power sites are used up. Under the most favorable circumstances, therefore, the dependence of France upon the German fuel supply can be only mitigated rather than overcome.

In the face of such an array of adverse conditions, the conclusion is difficult to avoid that France will find it impossible to maintain any very great degree of economic independence with respect to Germany. The advantage accruing to the latter from her possession of large coal resources is so great that she will in all probability be able, if she so desires, to secure as much Lorraine ore as well as raw iron and steel as she may require, merely by doling out limited supplies of coal and coke. In anything comparable to a severe economic contest between the two countries, Germany, on purely economic grounds and under present conditions of industrial production—

that is, in an industrial system based chiefly upon coal as a motive force,—would be able to hold France in a position little short of economic thralldom.

Both France and Germany might be expected to suffer from the economic rivalry which would be certain to follow an attempt to maintain a high degree of independence, but for France the consequences would be particularly serious. The ultimate result would be to perpetuate the economic instability, the loss of productive capacity, the international fear and distrust, and the constant danger of armed conflict that have thus far characterized the politico-economic relations of post-war Europe.

II. POLITICAL METHODS

In a deliberately adopted program of maintaining the maximum degree of economic independence, both France and Germany would be partly responsible, although France is faced with the more urgent necessity of taking some immediate step to safeguard her position. In like manner France rather than Germany is called upon to decide whether or not the method of political pressure is to be employed in seeking a solution of the Ruhr-Lorraine industrial problem. It is true that Germany also must decide upon her general attitude towards the problem, whether it is to be that of friendly co-operation or of economic rivalry. Her decision will doubtless be partly determined by political considerations, and her method of dealing with the problem may there-

fore be partly political. But Germany's role for the present is likely to be mainly passive; she is likely to feel that she can afford to wait, for time is working in her favor; but for France the problem is immediate and vital.

France possesses both the power and a strong motive for the application of political pressure. In the first place, she is at present in the stronger political position, just as Germany holds the stronger economic position; and in the second place, she is faced with almost certain disaster in a purely economic contest with Germany. If she plans a program of economic independence, therefore, she will in all probability consider herself fully justified in resorting to political pressure in order to equalize as far as possible the economic struggle that is likely to ensue. Her motive is rendered the more compelling by her intense fear of the possibility of German aggression and her consequent need for a guarantee of security.

There are two principal methods by which France can, if she wishes, employ political pressure in dealing with the problem presented by her iron and steel industry. In the first place, she can utilize her rights under the reparation clauses of the Treaty of Versailles, both for the application of pressure in a general way and for the purpose of forcing Germany to deliver coal and coke. Secondly, in conjunction with her allies she holds under military occupation a large part of the territory of western Germany, which makes it possible for her to complement the

more general pressure of the reparation demands by direct action. Even though the Cologne bridge-head as well as the Ruhr district should be evacuated immediately, France and her allies will still hold most of the German territory west of the Rhine.

Now according to her own interpretation of the Treaty of Versailles she has the right to take practically any measures she might wish in case Germany should fail to carry out the mandates of the Reparation Commission. An example of the kind of action she considers herself authorized to take in such a contingency is the occupation of the Ruhr; and the mere existence of her claim to the right to resort to such action provides her with a powerful political weapon in case she might desire to use it.

It is true that the danger of a resort to military action has been somewhat reduced by the terms of the London Protocol of August 16, 1924, which provide for arbitration both in fixing the quantities of coal and coke to be delivered on the reparation account and in the question of Germany's failure to carry out the mandates of the Reparation Commission. But in spite of this safeguard, the fact remains that France, in that protocol itself, asserted her intention to maintain her freedom of action under her own interpretation of the Treaty of Versailles.⁶ By her occupation of the left bank of the Rhine and her complete control of the shipping on

⁶ See Article 5 of Paragraph 17 of Annex IV of the Protocol of London, Aug. 16, 1924.

that river she is in a position to hamper and disrupt the economic life of Germany almost as seriously as by the occupation of the Ruhr itself. Moreover, she might insist—indeed from her own point of view she might feel entirely justified in insisting—that for what she might consider a violation of the Treaty, either in the question of reparation, or disarmament, or some other stipulation, the military occupation of the Rhine provinces should be indefinitely prolonged. And the mere menace of such measures might be utilized by France in forcing Germany to come to terms, both in the matter of the fuel supply and in the question of markets.

What would be the result of the application of political pressure by France? Without prejudice to the question whether she actually intends to resort to such measures as those outlined above, it is pertinent to enquire what might be expected as the economic and political consequences of such action. The immediate result, it is safe to assert, would be psychological rather than economic. It would intensify the bad feeling and distrust already existing between France and Germany, and the outcome would be conflict rather than co-operation between the Ruhr and Lorraine.

Under the menace of military action France might force the delivery of more coal and coke than she has received at any time since the war; she might even force Germany to prolong for a few years the free entry of the products of Alsace-Lorraine; but

under such conditions Germany might be expected to retaliate with every economic weapon at her command, and the effect would be only to increase the likelihood of a German boycott of French iron and steel the moment the political pressure was relaxed. The ultimate result would almost certainly be to increase the difficulties in the way of re-establishing a stable and normal state of political and economic affairs in Europe.

Political pressure might jeopardize the general reparation program. In the report of the Committee of Experts, which forms the basis of the recent settlement, it is clearly recognized and set forth that the possibility of payments by Germany will depend upon her ability to export more goods and services than she imports. The right of the Reparation Commission under the Treaty of Versailles to demand the delivery of German coal and coke extends until January 10, 1930. The period prior to that date has been designated as a time of recuperation for the German industrial and economic system. Now it is manifest that the recovery of productive efficiency and national prosperity in Germany will depend very largely on an adequate fuel supply. Consequently, there will be a limit to the amount of coal and coke that can be delivered to France without endangering the program established in the reparation settlement.

The situation in this respect will be essentially the same as during the five years following the final

ratification of the Treaty of Versailles. If Germany should be required to turn over to the Allies too large a part of her coal and coke output she would be obliged either to reduce the supply of her own consumers or to resort to importation, thus bringing about a situation similar to that which existed in 1922. The result would be at once to increase Germany's imports and to diminish her capacity to produce goods for export. The possibility of effective reparation payments would be reduced both with respect to raising funds in Germany and to making transfers to the Allies by means of an export surplus.

A similar dilemma is involved in the question of markets for the iron and steel output of Lorraine. If France should insist upon prolonging the period of unrestricted sales in Germany of the products of Alsace-Lorraine without granting similar privileges to German goods in the French market the result would be only to increase the difficulties of the transfer problem. Germany, under such conditions, might find it utterly impossible to develop an export surplus.

Might not France consider it better in the long run to disregard the reparation program? In other words, might she not deem it preferable to concentrate her efforts towards obtaining the greatest possible control of the Ruhr-Lorraine system, even at the expense of renouncing the hope of receiving any considerable reparation payments? It might be

argued that since the iron and steel industry is destined to occupy a permanent and a highly important place in the French national economy, it would be better to take relatively little account of the temporary considerations affecting the receipt of effective payments from Germany, but to utilize the rights granted by the reparation clauses of the Treaty in forcing Germany to enter into a compromise on the double question of raw materials and markets more favorable to France than could be otherwise obtained.

Furthermore, a large measure of control over a great industry that must inevitably be international in scope might be considered by France as a step towards a guarantee of security. In fact it would not be difficult for France to adduce arguments of overwhelming force in favor of the application of political pressure, if it be assumed that such pressure would really solve her problems. But herein lies the chief difficulty: there is excellent reason to believe that political pressure would not only fail to bring about a genuine solution but that it would only make matters worse for everybody concerned.

A forced agreement would be worthless and dangerous. It would be worthless because it would never really function. The experience of post-war Europe in the execution of dictated treaties should afford sufficient proof, if proof be needed, that such agreements cannot be effectively enforced. It would be dangerous because it would tend to perpetuate

a regime of incessant disputes which would result in a constant menace of war.

Even though it be assumed—an assumption that would by no means be warranted—that France could for a time bring about an increase in the relative importance of her iron and steel industry by the application of political pressure, such an increase would result not so much from the expansion of her own industrial activity as from a decrease in the activity of the rest of the Continent. In other words, there might be a shift in the relative economic importance of the Continental nations at the expense of the Continent as a whole. But the possibility of even this doubtful advantage for France is lessened by the certainty that decreased industrial activity in Europe would result in diminished demand for the industrial output.

Political pressure in dealing with the Ruhr-Lorraine industrial problem, whether applied by France or by Germany, would fail to bring about a genuine solution. Economically it would be in the long run injurious to both countries and to Europe as a whole, because it would result in a general loss of productivity; and Europe, after the tremendous losses of the World War, is in no condition to be deprived of any part of her potential wealth. From the point of view of peace as well as prosperity, the admixture of political methods in dealing with an essentially economic problem would tend to perpetuate the danger of war.

III. CO-OPERATION

If France and Germany in the development of their respective metallurgical industries are confronted with the impossibility of attaining complete independence of each other; if a determined effort on the part of either or both to develop the maximum degree of relative independence is likely to result in economic instability and the failure of both countries to realize the potential benefits inherent in their possession of large complementary deposits of iron ore and coal; and if, finally, a resort to political pressure by either country would only increase the difficulty of achieving a genuine solution of the Ruhr-Lorraine industrial problem, what, then, are the possibilities of the method of Franco-German co-operation?

In order to answer this question it will be necessary to consider, first, what co-operation would involve, both economically and politically; second, the obstacles in the way; and finally, the possibility of overcoming those obstacles.

Co-operation would involve a thoroughgoing economic entente between France and Germany. In all probability the Belgian-Luxemburgian Customs Union also would be a party to the understanding. The first result would be the re-establishment of the system of integration in the iron and steel industry of western Europe which existed before the war. Some of the great firms formerly operating both in

the Ruhr and Rhineland and in the Lorraine region would probably be re-amalgamated. Probably some new combinations would be formed. The essential result would be to reconstruct an organization wherein the control of raw materials, blast furnaces, steel plants, and the extensive equipment for the transformation of crude iron and steel into finished products would be vested in single industrial concerns. To a certain extent the economic *status quo ante bellum* would be re-established, and the tendency towards more and more complete integration would be resumed as well.

The ownership of the reorganized firms would be mixed French and German, and in some cases, Belgian and Luxemburgian. In certain concerns the majority of the stock would be owned by French nationals and in others by Germans. As a matter of fact, the new state of affairs would differ from that which existed before the war only in the degree of mixed ownership.

Integration might be expected to re-establish iron and steel production on a scale as great as or even greater than before the war. It is true that integration might conceivably be accomplished by individual Frenchmen and Germans without any particular economic entente between their respective countries, were it not for the question of distribution. The functioning of an integrated firm operating in both the Ruhr and Lorraine would it itself, however, involve international trade in raw materials, crude

iron and steel, and probably finished products. In addition, the marketing of the finished products of the concern would be seriously hampered by any tariff barriers which might exist between the two countries.

Co-operation in the conduct of a reconstituted and enlarged Ruhr-Lorraine system, therefore, would require either a very comprehensive commercial treaty between France and Germany or a virtual customs union eliminating the economic character of the Franco-German frontier. The latter arrangement, in fact, would probably be the only genuine solution of the problem. Under such conditions the pre-war tendency towards horizontal combinations might also be resumed. A new and enlarged steel syndicate would in all probability be found necessary in order to control production and allocate markets. Such an organization, in fact, could aid in doing for France what the pre-war *Stahlwerksverband* did for Germany in the way of building up the domestic market for iron and steel products.

In addition, it might be instrumental not only in building up the export trade of both countries but also in the negotiation of international agreements with other steel producing countries for the division of markets. The exact form of such horizontal combinations and international conventions it would be neither possible nor profitable to predict, but that some such development might be expected to follow a thoroughgoing economic entente there can be little

doubt. It is equally certain that such an entente, if it could be accomplished, would be of immense economic advantage to the continent of Europe as a whole as well as to the countries chiefly concerned.

The chief obstacle to an entente lies in the inequality of the economic strength of the two countries. Germany, primarily because of her enormously greater fuel supply, is economically stronger than France. Under such conditions, France, unless she has either a high degree of confidence in Germany's intention and ability to deal fairly with her or some assurance that in the case of a dispute a thoroughly equitable adjustment could be secured from an impartial source, cannot afford to run the risk involved in such an unequal partnership. Moreover, there is a strong feeling in France that in spite of every safeguard a close economic entente with Germany would mean the sacrifice of the economic identity of the French nation, and that unless France struggles to maintain a high degree of independence she will inevitably become a sort of appendage of the German economic system.

In this same apprehension of greater dependence upon Germany there is the question of French security from possible German aggression. This is further complicated by the fact that French national pride is involved. Many Frenchmen feel that an economic entente with Germany would be tantamount to a surrender of all that France stands for in modern civilization. Fortunately, such French-

men are probably not numerous enough to determine the policy of the French nation, but those who are concerned about the question of security probably are. France must somehow be assured that her security is not endangered before she will consent to enter into an agreement comprehensive enough to ensure the future functioning of the Ruhr-Lorraine system.

The point of view of Germany, of course, must also be considered in the matter of a workable entente. It is taken for granted that she would be willing to participate in such an arrangement, although the terms she would be ready to offer might have an important bearing upon the readiness of France to accept. If, for example, she should attempt to treat the French iron and steel industry as a mere appendage of her own industry, then France might feel justified not only in refusing but in utilizing all the political and military pressure she could muster in order to enforce a more reasonable attitude. But Germany after all has much to gain and little to lose by a thoroughly straightforward and equitable agreement with France, so that it may be safely asserted that the main obstacle is the French misgivings on the score of economic fair dealing and security.

A temporary obstacle is the reparation question. It will not be necessary to repeat here what has been said of the manner in which reparation payments add to the difficulty of marketing the iron and steel

output of Lorraine. The reparation clauses of the Treaty, in fact, could and should be used to facilitate a solution of the problem of production, in so far as the fuel supply of France is concerned. It is only in the question of Germany's ability to pay for imports of iron and steel as well as iron ore from Lorraine that the reparation payments have an effect exactly opposite to that which would be required to aid in solving the problem of markets. However, if anything comparable to the economic entente which is discussed above should be realized, the temporary character of the whole reparation question might be expected to become apparent. At all events, the nations concerned would not allow that question to interfere seriously with the solution of what is in the long run a vastly more important problem.

Only by the application of economic rather than political methods can the obstacles to an entente be overcome. If political considerations should be allowed to determine the attitude of France and Germany, then genuine co-operation between their coal and iron industries would probably prove to be a vain hope. The elements of fear and distrust, of national pride and chauvinism, might be expected to make a really workable arrangement impossible. If, on the other hand, the Ruhr-Lorraine industrial problem be approached primarily from the economic point of view, the arguments in favor of co-operation are of overwhelming force. Both France and Ger-

many have so much to gain and so little to lose by such an arrangement that if political considerations could be held in abeyance or left out of account altogether the iron and steel industries of the Ruhr and Lorraine might be expected to lose no time in reaching a practical agreement.

Economic co-operation should be carried out primarily by the industries themselves. The role of the French and German Governments should be confined to removing the existing political barriers to the freedom of exchange. In both countries the coal and iron industries are highly organized. In industrial and commercial matters their leaders have a common ground of understanding; economically they speak the same language. Given a clear field and no political favors on either side, they will be able to reach a workable agreement advantageous to all concerned. Tangible proof of this is furnished by the fact that practical agreements have actually been worked out by French and German industrial leaders—notably those between M. Loucheur and the late Dr. Rathenau, and between Senator de Lubersac and the late Herr Stinnes—which would probably have proved workable had they not been made political issues in the French Parliament.

Can France afford to run what may seem to her the risk of disregarding political considerations? Her decision must be arrived at after analysing all the elements of the situation. She will find it impossible to select a course of action calculated to

remove all risks and at the same time give full satisfaction to her economic requirements. Such being the case, she may be expected to decide upon the policy that will promise the best possible combination of minimum risk and maximum advantage. If the obstacle of fear and distrust of Germany be not too great, co-operation is obviously the best solution. The crux of the problem, therefore, is whether means can be devised to reduce the element of risk which France believes to be present.

There are two methods whereby France might be protected against any attempt on the part of Germany to subjugate the French economic system. One method could be applied in drawing up the terms of a commercial treaty between the two countries. The second might consist of adequate provisions for arbitration in the event of any possible dispute. Similar methods could be applied in the formation of individual industrial concerns as well as in the organization of sales syndicates. The World Court at the Hague might be designated as the arbitral agency in the case of disputes between the two governments, and in matters affecting the ownership and control of individual concerns or syndicated combinations, provision might be made for recourse to industrial courts constituted for the purpose.

Difficulties would, of course, be encountered in the negotiation of such agreements. France and Germany, as well as the individual industrial leaders of

both countries, would find themselves in opposition on many specific points; but the economic advantages of co-operation are so great that if the will to make an adjustment of disputed questions exists a way is likely to be found.

Co-operation could be made to provide a better guarantee of security than any other system. If the conclusions of our analysis of the alternatives is even approximately correct such a system could certainly be no worse guarantee than either an attempt to maintain a high degree of economic independence or the application of political pressure. But if it can be demonstrated that co-operation would in the long run offer a better guarantee of security to both France and Germany than any other arrangement for dealing with the Ruhr-Lorraine industrial problem, then the last obstacle to a Franco-German entente would disappear.

There are two principal reasons for believing that an economic entente between France and Germany would go far to solve the problem of security. In the first place, it would tend to facilitate moral disarmament. Two great nations engaged in business that is mutually advantageous are not so likely to hate and distrust each other as they would be if they kept their economic intercourse down to a minimum. This, in the long run, is probably the most important political argument that can be advanced for an economic entente.

In the second place, the fullest possible co-opera-

tion between France and Germany would provide a powerful economic impediment to a resort to military force in the case of a misunderstanding. It will be remembered that in 1914 the Franco-German frontier ran through the middle of the Lorraine iron fields. Germany by a swift military movement was able to seize the whole of the ore deposits at the very beginning of hostilities, thus ensuring control of practically the whole industrial agglomeration. The frontier is now some 40 or 50 miles farther east, and it is hardly conceivable that Germany could repeat the strategy of 1914, even if she wished to do so. Once the Allied troops are withdrawn from the Rhineland the position of France with respect to the Ruhr will be similar; she would not be able to seize the region quickly enough to secure control of the Ruhr-Lorraine system at the beginning of a war. In the event of an armed conflict between France and Germany the industrial agglomeration, far from being operated as a unit by one belligerent as in the Great War, would inevitably be torn asunder. The closer the economic union between the two countries, the more disastrous for both would be the consequences of disrupting the partnership.

It is not being argued that the realization of the economic loss involved would alone be sufficient to make war between France and Germany impossible; but it is suggested that economic co-operation between the Ruhr and Lorraine would constitute an important contribution to guaranteeing the peace as

well as the prosperity of Europe. Economic forces may or may not be decisive in causing or preventing wars, but few will be found to doubt that their influence is great.

No claim is here advanced that co-operation would solve the immediate problem of French and German security. In view of the present state of mind in the two countries it is highly probable that some specific agreement among a group of European nations will be necessary in order to re-establish a political atmosphere in which co-operation could thrive. If the efforts now being made in this direction should be successful there can be no doubt that a Franco-German economic understanding would be greatly facilitated. But even though such efforts should utterly fail, the fact would remain that economic co-operation in the long run offers a better guarantee of security than any other conceivable method of dealing with the Ruhr-Lorraine industrial problem.

What can be done by the various public agencies in Europe to facilitate co-operation? The governments can be of service primarily by the removal of obstructions, although their role will call for real statesmanship rather than for mere political maneuvering. But the essential task of the governments is nevertheless that of permissive action rather than positive control. It is for them to clear away the obstacles that hinder the re-amalgamation of the Ruhr and Lorraine into a unified economic system.

The Reparation Commission, on the other hand, can for a time play a constructive role. But it can do so only if the governments on which it depends allow it to perform the functions theoretically assigned to it by the Treaty of Versailles, that is, the functions of a genuine international tribunal. One of its most important tasks will be to determine the amount of coal and coke that Germany can deliver to the Allies. Judging from the experience of the past, the quantity of coal as distinct from coke or coking coal that can be furnished without serious damage to the productive capacity of Germany in the next few years is not likely to be great.

Due to the loss of East Upper Silesia and, temporarily at least, the Saar basin, Germany, unless she is able quickly to obtain a substantial increase in her production, cannot deliver very large quantities of coal without materially reducing her pre-war consumption on the one hand, or importing coal on the other. In fact, she will probably have to import considerable quantities in any case if she is to have available as much as her present territory consumed before the war. Eventually she may be expected to increase considerably her production, but it is hardly possible that she will be able thus to make up for her losses of coal producing territory for several years.

If for any reason, however, either of increased production or of failure on the part of German industry to consume as much coal as anticipated, there should be a surplus available for export, then France and

the other Allies ought to have an opportunity to purchase it with the reparation funds at their disposal. Only the actual situation, as revealed from time to time by the course of events, can guide the Reparation Commission in determining the specific quantities to be delivered. Just as in the past, the Commission must balance the needs of the Allies for coal against the general reparation program, which requires for its successful execution the economic recovery of Germany.

The situation with respect to coke is somewhat different. Neither Upper Silesia nor the Saar region produces any considerable quantity, so that the coke producing capacity of Germany is about as great as before the war. It would not be unreasonable to demand, therefore, the delivery to Lorraine of a considerable proportion of the coke output of the Ruhr, assuming, of course, that coal and coke production proceed normally. The actual quantities should be fixed after the most careful study of Germany's own requirements, as in the case of coal; but the re-establishment of the Ruhr-Lorraine system is of such importance to the economic life of Europe as to warrant special consideration.

Obviously the coke deliveries should be made on the reparation account, at least during the execution of the coal clauses of the Treaty, provided the German financial situation, both internal and external, will permit. If not, the coke should nevertheless be furnished; if necessary, against payment. The

Reparation Commission is in a position, by virtue of its powers under the Treaty, to meet and handle the situation in either case. If payment for the coke should become necessary the arrangement under the protocol of Spa in 1920, whereby advances were made to cover the value of the deliveries, might be repeated; or, failing that, the Commission might facilitate an arrangement for ordinary purchases. The matter of really great importance is that Lorraine should receive the coke.

It is true that there is no provision in the peace treaty for the supply of the Ruhr district with Lorraine ore or crude iron and steel, so that the powers of the Commission are by no means sufficient to restore the normal exchange relation between the two regions; but if coke be dispatched to Lorraine the economic advantage of utilizing the transport equipment to ship back something, either iron ore or crude iron and steel, will be so great that a powerful incentive will exist for a rational system of exchange. In fine, the Reparation Commission can play a great constructive role by considering the Ruhr-Lorraine industrial problem from the broad point of view of European and world reconstruction and by using such powers as it has in facilitating a rational system of production and distribution of raw materials and goods.

Genuine co-operation between France and Germany will go far to restore to Europe both prosperity and peace. It is safe to predict that if such co-opera-

tion can be assured the process of steady development of the Ruhr-Lorraine system which has been interrupted by the Great War will go on. The same territory may be expected to resume production on a scale comparable with that of the years preceding the war, with the same progressive growth of productive activity. Similarly, the markets for the products of the industrial agglomeration will probably be found about where they were before, although the consuming capacity of France will be likely to increase. France and Germany together will produce and consume the bulk of the iron and steel output of the Continent.

Just as before the war, the industries of the Ruhr and Lorraine will find markets wherever they can; they will bargain and trade with each other, and no doubt they will have endless difficulties in obtaining a perfectly satisfactory steel syndicate; but their relations will nevertheless be those of partners in an organization which neither can afford to destroy. Once the troublesome question of military security is settled or forgotten, the matter of which country is the junior or senior partner will lose most of its significance.

The iron and steel of a great Franco-German combination will, of course, become an important factor in the markets of the world. A superficial view of this element of the situation might lead to the conclusion that the United States and Great Britain and other steel producing countries would look with

misgiving upon the creation of such an important competing unit. No doubt there are still to be found those who hold to the old doctrine of the mercantilists that national prosperity is obtainable only by selling as much and buying as little as possible. But to those who realize that material well-being depends primarily on the production of useful goods and their exchange and distribution in such a manner as to meet the needs of the consuming population wherever it may be found, the prospect of increased productive activity and prosperity on the continent of Europe will cause no uneasiness.

On the contrary, it will be remembered that in the years preceding the Great War the economic welfare of the whole world, despite the imperfections in the organization of society, was steadily increasing; and that at the same time the Ruhr-Lorraine system was producing ever greater quantities of iron and steel and competing in the markets of the world. And it will be realized that a combination of the iron and steel industries of Germany and France will represent in large measure the re-establishment of the conditions and tendencies existing at the outbreak of the war.

More than ever before, the economic welfare of Germany and France will depend upon the efficient functioning of the Ruhr-Lorraine system. Germany will remain a great industrial nation, although for some time to come she is not likely to recover the productive capacity of the pre-war German Empire

on account of her loss of territory and raw materials. The importance of France as an industrial nation has been automatically increased by her gain of territory and raw materials. But by the same change in political frontiers each nation has become more dependent upon the other for the materials upon which industrial development is based.

If political barriers are removed, the two principal elements of the Ruhr-Lorraine industrial system may be expected to become more closely welded together than ever before. This was plainly the trend of economic development before the war. As the years pass and the emotions of the war give place to the more normal activities of life, the economic union between France and Germany will have a tendency to end the age-long feud between them. Even as the coke of the Ruhr and the iron ore of Lorraine have been a source of conflict in the past, they might become the common basis for renewed prosperity and genuine peace.

APPENDICES

APPENDIX A.

REPARATION IN KIND

When the reparation clauses of the Treaty of Versailles were under consideration by the Peace Conference it was realized that a certain proportion of the payments to be required of Germany could be most readily made in goods. At the same time it was manifest that the delivery of certain categories of goods needed for reconstruction purposes would meet the requirements of the Allies fully as well as payments in cash. In order to take due advantage of these conditions, article 236 of the Treaty was drawn up as follows:

“Germany further agrees to the direct application of her economic resources to reparation as specified in Annexes III, IV, V, and VI, relating respectively to merchant shipping, to physical restoration, to coal and derivatives of coal, and to dyestuffs and other chemical products; provided always that the value of the property transferred and any services rendered by her under these Annexes, assessed in the manner therein prescribed, shall be credited to her towards liquidation of her obligations under the above Articles.”

The first two categories of reparation in kind, namely, merchant shipping and physical restoration of the devastated regions, were intended to provide for direct

replacement of property destroyed as a result of the war. The delivery of coal and its derivatives, as we have seen, was to play a somewhat wider economic role, as well as to compensate for the damage inflicted upon the coal mines of certain Allied countries. Dyestuffs and chemicals were demanded primarily because the Allies urgently needed a part of the large supply which Germany already had on hand and was in a position to produce.

From the point of view of European reconstruction, the provision for the direct physical restoration of the devastated regions was in theory the most important, although in practice this provision, for a number of complex reasons, was not carried out in the manner intended by the Treaty. Next in theoretical importance came coal deliveries, and then merchant shipping, while the demands for dyestuffs and chemicals were more in the nature of ordinary commercial transactions and the monetary values involved were relatively small. Moreover, the execution of the stipulations for the delivery of merchant shipping and dyestuffs and chemicals, while involving a great deal of complex administration, was nevertheless carried out without any particular difficulty. The present discussion, therefore, will deal primarily with the provision for physical restoration, and only a tabular statement will be included of the deliveries of the other categories of reparation in kind.

Deliveries for the reconstruction of the devastated regions were provided for in Annex IV of Part VIII of the Treaty of Versailles. Additional provisions which by a subsequent amendment assumed a certain importance were included in Annex II. The salient paragraphs of these two annexes are as follows:

Annex IV.

2.

The Allied and Associated Governments may file with the Reparation Commission lists showing:

(a) Animals, machinery, equipment, tools and like articles of a commercial character, which have been seized, consumed or destroyed by Germany or destroyed in direct consequence of military operations, and which such Governments for the purpose of meeting immediate and urgent needs, desire to have replaced by animals and articles of the same nature which are in being in German territory at the date of the coming into force of the present Treaty;

(b) Reconstruction materials (stones, bricks, refractory bricks, tiles, wood, window-glass, steel, lime, cement, etc.), machinery, heating apparatus, furniture and like articles of a commercial character which the said Governments desire to have produced and manufactured in Germany and delivered to them to permit of the restoration of the invaded areas.

3.

The lists relating to the articles mentioned in 2 (a) above shall be filed within sixty days after the date of the coming into force of the present Treaty.

The lists relating to the articles in 2 (b) above shall be filed on or before December 31, 1919.

The lists shall contain all such details as are customary in commercial contracts dealing with the sub-

ject matter, including specifications, dates of delivery (but not extending over more than four years), and places of delivery, but not price or value, which shall be fixed as hereinafter provided by the Commission.

4.

Immediately upon the filing of such lists with the Commission, the Commission shall consider the amount and number of the materials and animals mentioned in the lists provided for above which are to be required of Germany. In reaching a decision on this matter the Commission shall take into account such domestic requirements of Germany as it deems essential for the maintenance of Germany's social and economic life, the prices and dates at which similar articles can be obtained in the Allied and Associated countries as compared with those to be fixed for German articles, and the general interest of the Allied and Associated Governments that the industrial life of Germany be not so disorganised as to affect adversely the ability of Germany to perform the other acts of reparation stipulated for.

Machinery, equipment, tools and like articles of a commercial character in actual industrial use are not, however, to be demanded of Germany unless there is a free stock of such articles respectively which is not in use and is available, and then not in excess of 30 per cent. of the quantity of such articles in use in any one establishment or undertaking.

The Commission shall give representatives of the German Government an opportunity and a time to be heard as to their capacity to furnish the said materials, articles and animals.

The decision of the Commission shall thereupon and at the earliest possible moment be communicated to the German Government and to the several interested Allied and Associated Governments.

The German Government undertakes to deliver the materials, articles and animals as specified in the said communication, and the interested Allied and Associated Governments severally agree to accept the same, provided they conform to the specification given, or are not, in the judgment of the Commission, unfit to be utilized in the work of reparation.

Annex II.

19.

“Payments required to be made in gold or its equivalent on account of the proved claims of the Allied and Associated powers may at any time be accepted by the Commission in the form of chattels, properties, commodities, businesses, rights, concessions, within or without German territory, ships, bonds, shares or securities of any kind, or currencies of Germany or other States, the value of such substitutes for gold being fixed at a fair and just amount by the Commission itself.”

19. (2)

“Germany shall on demand provide such material and labour as any of the Allied Powers may, with the prior approval of the Reparation Commission, require towards the restoration of the devastated areas of that Power or to enable any Allied Power to proceed to the restoration or development of its industrial or economic life. The value of such material and labour shall be determined by a valuer appointed by Germany and a valuer appointed by the Power concerned and in default of agreement by a referee nominated by the Reparation Commission.”

The technical provisions of Annex IV were not carried out by the Reparation Commission. It will be observed that the lists referred to were intended to become, after examination by the Commission and such modifications as might be deemed necessary upon consideration of the German point of view, specific orders for the delivery of goods. In practice it was found inexpedient to follow this procedure, chiefly because of the delay until January 10, 1920, of the final ratification of the Treaty. Obviously the lists specified in paragraph 2 (b) could not be submitted by December 31, 1919, since the Reparation Commission had no official existence at that time. The Commission found it necessary in fact to extend the dates for the submission of all the lists to August 15, 1920, and in certain cases to February, 1921.

However, the bulk of the lists were submitted by the Allied Governments in March and April, 1920. They covered an extraordinary range of materials from simple objects to complete industrial installations, as well as

demands for bulk deliveries such as timber, seeds, cattle, and many others. The value of the supplies called for was estimated very approximately at 10 billion gold marks, and their distribution as to categories of supplies and among the allied countries was as follows: ¹

FIGURES IN MILLIONS OF GOLD MARKS

	Great Britain	France	Italy	Belgium	Serb-Croat-Slovene State
Timber, textiles, paper.	7	4,000	350	210	7
Seeds .....	..	550	40	13	..
Construction material, metal manufactures..	..	500	400	70	35
Industrial plant.....	13	800	170	150	50
Cattle .....	..	300	8	120	..
Various .....	..	400	100	300	50
	20	6,550	1,068	863	142

The lists submitted subsequent to April, 1920 amounted to about 500,000,000 gold marks, so that the total value of the deliveries which the Allies declared their intention to require from Germany under Annex IV was about 10.5 billion gold marks.

Reconstruction deliveries were gravely compromised by cumbersome administration. It was realized by the Reparation Commission that to make a thorough examination and appraisal of all the lists submitted by the Allies would require many months, while their discussion with the German Government in sufficient detail to give them the character of definite orders would take still longer. On the other hand, the needs of the devastated

¹ *Report on the Work of the Reparation Commission, Vol. V, p. 120.*

regions were urgent, and reconstruction was actually going forward with whatever materials could be secured, and from whatever source. Consequently, the Commission made only a brief preliminary examination, which resulted in the suppression of a few items of raw materials that could obviously not be furnished, and sent the lists to the German Government as a general indication of the extent of the Allied demands, with an invitation to submit offers based on the categories of supplies indicated.

What the entire transaction amounted to was merely this: the Reparation Commission announced to the German Government that the Allies were prepared to accept goods of the classes mentioned, provided the qualities, prices, and methods of delivery were satisfactory. In view of the fact that the German Government itself did not ordinarily either produce or sell the categories of goods required by the Allies, it is readily understood that the results of this method of procedure would be neither expeditious nor extensive.

Up to the end of 1920 the German Government had offered material to an estimated value of 550 million gold marks, but 275 millions of this consisted of motor trucks, which were not needed, and 105 millions of domestic furniture, which would have been useless for the devastated regions since the inhabitants needed houses before they could use furniture. Other offers were unacceptable because of the prices demanded or on account of conditions attached to delivery or for other similar reasons.

According to the lists presented by the Allied countries in March and April, 1920, deliveries amounting to at

least 2.5 billions of gold marks per year for a four-year period were contemplated. In fact, due to the more urgent needs of the devastated regions, the deliveries in the first years should have been even greater. But the administrative methods were so cumbersome that in practice the materials ordered amounted to only a small fraction of the sums originally contemplated, while the actual deliveries were even smaller.

Owing to the large number of compromises, substitution agreements, and modifications effected in the demands of the Reparation Commission it is not possible to give a statement of the specific orders passed, but the total value of the deliveries made under Annex IV to all the Allies amounted in 1920 to only 83,052,887 gold marks, and in 1921 to 74,354,058.68 gold marks.² Thus, in the two years when reconstruction materials were most urgently needed, the quantities actually received amounted to hardly more than 3 per cent of those contemplated.

Administrative methods were simplified only after the most urgent need for reconstruction material had passed. The first comprehensive scheme for a more direct method of securing deliveries was drawn up and signed on October 6, 1921, at Wiesbaden, by M. Louis Loucheur on the part of France and Herr Walther Rathenau on the part of Germany. In its essence, the agreement provided for direct negotiation between the buyer of reconstruction material in France and the seller in Germany. Prices were to be fixed and all other disputed questions were to be decided, where agreement could not be reached,

² Official statement of the Accounting Service of the Reparation Commission.

by an arbitral board composed of one Frenchman, one German, and a neutral third.

In the meantime, however, a somewhat similar procedure had been applied since February, 1921, to certain classes of deliveries for which exact specifications had to be furnished. Also the amendment to paragraph 19 of Annex II referred to above had been made in May, 1921, by the Allied Governments, making possible the receipt of materials not necessarily destined for the devastated regions. This amendment, in fact, was designed to extend very considerably the scope of the whole program of reparation in kind, although full advantage was never taken of its possibilities except by the Serb-Croat-Slovene State.³

The Wiesbaden Agreement was intended to cover deliveries to France under Annexes II and IV and to replace the procedure therein provided. Consequently it had to be submitted to the Reparation Commission, and subsequently to the Allied Governments, for ratification. All this took time and it was not until March 31, 1922, that the agreement was officially declared to be in effect. Even then certain safeguards and restrictions were incorporated in the ratification.

Before the Wiesbaden Agreement began to function, however, a similar convention was concluded between the agents of the Reparation Commission and the German Government, providing for much the same administrative procedure for deliveries to the Allies other than France. This convention, known as the Berlin Agreement, was ratified on June 2, 1922. At the same time the French Government negotiated a supplementary agreement

³ See p. 290 below.

(known as the Gillet Agreement) substituting the procedure provided in the Berlin Agreement for the bulk of the deliveries contemplated in the original scheme drawn up at Wiesbaden.

Under the new administrative procedure any Allied national was at liberty to conclude a contract with a German national, with the understanding that payment for the goods in question should be made by the German Government and that the sums involved should be credited on the reparation account, provided always that the contract did not relate to goods specifically excluded from the scope of the general covering agreements. However, such contracts were subject to the regulations governing the external commerce of the different countries, such as import duties and the like, so that even in theory the Allied nationals were no more free to obtain materials or goods from Germany than from any other source. In point of fact they were somewhat less free, inasmuch as the maximum tariffs were in effect for German goods, whereas various commercial treaties with other countries provided for lower import duties.

But the most serious defect of the general agreements for deliveries in kind was that they were concluded too late. Reconstruction had been going forward since the beginning of the year 1919, and more or less regular methods of obtaining materials and supplies from sources other than Germany had been worked out. By the middle of the year 1922, when the new agreements were in operation, either the most urgent of reconstruction needs had been met, or arrangements had already been made for securing from other sources the bulk of the additional materials required.

In the year 1922, France, the Allied country which obviously required more reconstruction material than any other, actually received, under Annexes II and IV and the general agreements, supplies amounting to some 19,292,000 gold marks.⁴ The orders placed amounted to somewhat more, but to only a small percentage of the amounts contemplated either in March and April, 1920, or in the moratorium agreement announced by the Reparation Commission on March 21, 1922.⁵

Without attempting to discuss in detail the various questions and disputes that arose over specific categories of deliveries—such as timber, cattle, and the like—a general impression of the comparative failure of the whole program of reparation deliveries for the purpose of physical restoration may be had from the table ⁶ on pages 290 and 291.

It will be observed that in the four-odd years elapsing from the time the Allied countries indicated their intention to accept deliveries under Annex IV amounting to some 10,000,000,000 gold marks, the actual receipts amounted to only 246,372,645 gold marks, or less than

⁴ *Report on Work of the Reparation Commission*, Vol. V, p. 132.

⁵ The moratorium agreement provided for deliveries in kind during the year 1922 amounting to 1,450,000,000 gold marks, 950,000,000 of which were to go to France. According to a communique of the Reparation Commission of April 24, 1923, the orders for all kinds of deliveries placed by France amounted to 287,000,000 gold marks, including shipping, coal and coke, dyestuffs, cables, etc. Coal and coke and other *deliveries* not covered by Annexes II and IV and the agreements amounted to 188,935,734 gold marks, while the *orders* for coal and coke alone (taking the official programs notified and applying the average prices credited for the deliveries made) amounted to about 210,000,000 gold marks. At the outside, therefore, the orders placed by France could not have amounted to over 77,000,000 gold marks.

⁶ Reproduced by permission of the General Secretary of the Reparation Commission.

25 per cent of the quantities contemplated. Of the miscellaneous deliveries under Annex II, only Serbia took anything like full advantage of her opportunities, and this was manifestly due to the fact that she had no extensive industrial establishment of her own.

The foregoing account of reparation payments in kind does not purport to set forth all the complexities of the administrative problems involved. Nor is any attempt made to apportion the blame for the comparative failure of the plan for restoring the devastated regions by means of German reconstruction material, except to suggest that it must be attributed chiefly to the inability of the Peace Conference to foresee and provide for the vast administrative organization that would be required.

SUMMARY OF DELIVERIES IN KIND MADE BY GERMANY FROM 11

POWERS	ITEM 248	ANNEX II	ANNEX III	ANNEX IV
	Proceeds of Reparation Recovery Acts	Miscellaneous Deliveries and Livestock	Ships and Inland Watercraft	Livestock, Miscellaneous Deliveries, and Reconstruction Material
	G. M.	G M	G. M	G. M.
United States	—	—	—	—
British Empire	372,384,055.28	824,880.20	247,194,017 54	—
France	—	2,617,896.75	67,480,280 11	102,072,020.38
Italy	—	54,056,051.88	4,560 858.28	52,142,920 37
Japan	—	—	6,233,456 66	—
Belgium	—	1,705,941.27	2 590 121 39	68,782 095 04
Greece	—	11,949,254.85	5,505,367 41	16,244 25
Servia	12,791.52	194,522,080.65	155,601.00	23,359,355.06
Roumania	—	—	123,041.05	—
Portugal	—	—	277,164.42	—
Poland	—	—	—	—
Czechoslovakia	—	—	—	—
Luxemburg	—	—	—	—
Textile Alliance, Inc.	—	—	—	—
Dyestuffs to German Buyers	—	—	—	—
Undistributed (see Note 1)	—	—	406,948,151.98	—
Totals	372,396,846.80	265,676,105.60	741,068,059.84	246,372,645.10

NOTE: Advance payments made on contracts and orders under Annexes II, III and IV and the Bemelmans-Cuntze & Gillet-Ruppel Agreements, are credited in the accounts of the year in which they were due.

NOTE 1: The undistributed amounts are—

(a) G. M. 406,948,151.98, which is the difference between the credit granted Germany and the debit to the Powers in respect of *Ships* delivered prior to 1 May, 1921.

NOVEMBER, 1918, TO 31 AUGUST 1924, AS KNOWN AT 30 SEPTEMBER, 1924

ANNEX V	ANNEX VI	VARIOUS	BEMELMANS- CUNTZE AND GILLET- RUPPEL AGREEMENTS	ARMISTICE DELIVERIES	TOTALS
Coal and By-Products	Dyestuffs and Pharma- ceutical Products	Louvain Library. Cables. Inland Watercraft (Arts. 339 and 357)		Rolling Stock, Agricultural Material. Fixed Railway Material, Abandoned War Material, Motor Lorries	
G. M.	G. M.	G. M.	G. M.	G. M.	G. M.
—	—	—	—	23,375,000 00	23,375,000.00
—	24,219,827 44	—	—	21,375,000.00	665,997,780 46
635,676,607.41	16,445,997.77	15,128,629 62	3,989,649.48	445,637,707.24	1,289,048,798.76
209,224,721.13	31,193,005.51	5,726.22	—	15,306,423 30	366,489,706.69
—	2,768,089.60	—	—	—	9,001,546.26
111,817,136.96	17,508,977.97	2,066,469.13	2,999,027.58	452,380,354.60	659,850,123.94
—	—	—	—	—	Cr 23,250,000 00
—	3,297,796.64	—	—	—	20,768,663 15
—	2,590,369.12	577,600.00	39,799,613.46	—	261,017,410 81
—	5,608,020.59	—	23,765,625.55	4,408,028.80	33,904,715.99
—	—	—	14,579,383.46	—	14,856,547.88
—	—	415,171.20	—	14,704,587.34	15 119,758.54
—	—	10,252,486 50	—	6,848,295 30	17,100,781.80
57,888,500.13	—	—	—	—	57,888,500 13
—	4,875,568.21	—	—	—	4,875,568.21
—	3,026,100.35	—	—	—	3,026,100 35
28,945,905.03	—	49,000,000.00	—	—	484,894,057 01
1,043,552,870.66	111,533,753.20	77,446,082.67	85,133,299.53	984,035,396.58	3 927,215,059.98
					Cr 23,250,000.00
					(see Note 2)
				Net total	3,903,965,059 98

(b) G. M. 28,945,905.03, the difference in value of deliveries of coal by sea to Italy at F.O.B. and interior prices respectively. Germany is credited at the former price; Italy is debited at the latter.

(c) G. M. 49,000,000.00 in respect of submarine cables. The distribution to the Powers has not yet been fixed.

NOTE 2: Germany's credit and Belgium's debit is reduced by G. M. 23,250,000 00 taken out of Reparation Account for the year 1922 and applied towards Belgium's claims for Restitution.

J. Jailler

Accountant General.

Paris, 8 November, 1924.

APPENDIX B.

THE FINAL DEFAULT ON COAL

On December 28, 1922, the French Delegate and President of the Reparation Commission demanded on the order of his government that Germany be declared in default on coal deliveries within the meaning of paragraph 17 of Annex II of Part VIII of the Treaty of Versailles. Two days previously a similar demand had been made with respect to deliveries of timber. Germany had been officially declared in default by a majority vote of the Reparation Commission, and the Allied governments had been notified accordingly.¹ The request for a declaration of default on coal as well as on timber came as a part of the general breakdown of reparation negotiations between France and Great Britain at the end of the year 1922.

Before the Reparation Commission commenced its deliberations on the question of default, the German government was given an opportunity to present its case. The meeting took place on January 9, 1923, in the conference rooms of the Reparation Commission in Paris, M. Barthou, the French Delegate and President of the Commission, presiding. The plenary session was called

¹The *Report on the Work of the Reparation Commission*, Vol. V, p. 248, contains a complete account of the declaration of default on timber deliveries. The present brief account of the meeting on coal is drawn from the private notes of the author who was present in his capacity of an international official of the Reparation Commission.

to order, and the German representatives were invited to enter. M. Barthou made a brief statement of the previous demands of the Reparation Commission for the delivery of coal, of the quantities actually delivered to date, and of the repeated admonitions of the Commission to the German government to increase shipments. The German representatives were then invited to make whatever statement they saw fit.

Their case was a strong one. First of all, they pointed out, the actual deficit was small, being not more than 10 or 15 per cent at the most; and they argued that in ordinary commercial contracts a deficiency of 10 per cent did not constitute a default. Moreover, the Allies, and France in particular, had added to the difficulty of making deliveries by refusing to accept a considerable part of the coal offered, on account of the quality, although German consumers had been glad to accept this same coal. As was well known to the Reparation Commission, there had been a railway strike at the beginning of the year which had necessarily reduced shipments. After the partition of Upper Silesia in June, it had been necessary for Germany to increase her coal imports considerably, and this only added to the already unbearable financial burden of making deliveries to the Allies.

The strongest argument of the Germans was the financial consequences of coal deliveries. They laid great stress on the double burden imposed both on the budget and on the balance of international payments by the importations of coal necessitated by the deliveries on the reparation account. Their experts brought forward vast quantities of statistical data tending to prove that Germany had been absolutely obliged to import large quan-

tities of coal, and that even so, her industrial activity had been greatly hampered for lack of fuel. The deliveries of coal to the Allies, the Germans argued, had thus contributed largely to Germany's financial collapse and to the disastrous fall in the foreign exchange value of the mark.

Finally, against a technical default they cited a decision of the Reparation Commission of March 21, 1922, providing that any deficits occurring during the current year in deliveries in kind should be made up by an increase in cash payments. The Germans argued that they could not legally be declared in default until they had been called upon to pay in cash for the deficit in coal deliveries. They implied their readiness to comply with such a demand in order to avoid a declaration on the part of the Commission that they had failed to meet their obligations.

No considerable discussion was had with the German representatives concerning any of the points brought out in their statement. A few questions were asked by the different delegates of the Commission in order to clear up certain matters of detail, but the meeting was in no sense one of negotiation with the Germans. They were simply granted a hearing before the Commission, as was their right under paragraph 9 of Annex II of the Treaty; and even this was a mere formality, for the Reparation Commission was already familiar with every argument they were able to advance. When the Germans retired from the meeting, which they did after the completion of their statement, it was still manifest that there had been a shortage of at least 10 to 12 per cent in meeting the demands of the Reparation Commission, which could not

reasonably be accounted for on the ground of physical *force majeure*.²

Upon the retirement of the German Delegation the Commission took up the formal discussion of the question of default. M. Barthou stated the case of France, Italy and Belgium. He reviewed the record of Germany with respect to coal deliveries, laying particular stress on her reluctance to deliver coke, and pointing out that the metallurgical industry had been ever since the war more active in Germany than in Lorraine. As an example of what could be done when the will to deliver coal existed, he cited the execution of the Protocol of Spa, which was carried out under the menace of energetic military sanctions. Germany's obligation to deliver coal, he reminded the Commission, was of a special nature, and did not properly come under the procedure contemplated in the letter of March 21, 1922, referred to by the German Delegation. After having reviewed the various attempts of the Commission to secure increased deliveries of coal, M. Barthou proposed that Germany be declared in default, and that the Allied governments be notified accordingly, as provided in paragraph 17 of Annex II of Part VIII of the Treaty of Versailles.

The opposing case was stated by the British Delegate, Sir John Bradbury, who reviewed and analyzed the German arguments. He called attention to the smallness of the deficit and argued that the penalty proposed by the French Delegate—the declaration of default—was severe in a measure out of all proportion to the gravity of the German shortcoming, if indeed there had been any short-

² The actual shortage with respect to the demands of the Reparation Commission was from 18 to 20 per cent.

coming in this particular case. In his opinion, the question could properly be considered only in relation to the larger reparation problem: the Commission should first take account of the financial consequences of the deliveries of coal already made, and then decide whether or not the German government should be declared in default for not delivering still more. Finally, he reminded his colleagues of the letter of March 21, 1922, already referred to by the German delegation, and expressed the opinion that Germany could not legally be declared in default on deliveries in kind until she had been called upon and had refused to make up the deficit in cash.

At the close of Sir John Bradbury's remarks, which had been listened to with the closest attention, the Chairman asked the Italian and Belgium delegates in turn if they had any statement to make. Neither cared to add anything to the previous discussion. Before proceeding to take the vote of the Commission, however, the Chairman called upon Mr. Roland W. Boyden, Unofficial Delegate of the United States for any remarks he might care to make. The response was a well-rounded statement not only of the legal aspects of the question then before the Commission, but of the crux of the reparation problem as well. Since the matter is and must continue to be of much more than academic interest, Mr. Boyden's remarks, with his special permission, are here quoted:

Not being one of the official judges as are my colleagues, it would be easy for me to remain silent, but I prefer to assume my own responsibility in my personal capacity, as you have assumed yours in your official capacity. In English and American courts, it is not uncommon for a person of judicial education to sit with the official judges as an *amicus curiæ* who though in fact not a judge expresses his own personal view. In some such

capacity I have endeavored to form an opinion upon the judicial aspects of the present situation.

Paragraph 17 of Annex II refers to default and paragraph 18 refers to voluntary default. I am in agreement with the decision of the Commission that in both cases voluntary default is intended.

What is voluntary default? One excuse for non-performance will be recognized by all, viz.: *force majeure*, but, in my opinion, the expression "voluntary default" includes other excuses. It means the doing or the failure to do something, with the knowledge at the time that the action or the failure to act might reasonably have the effect of resulting in default.

There is, in my opinion, a very considerable difference between the question now under discussion and the question as it arose in connection with deliveries of timber. The demand for timber was a single demand. The main reason for the timber default seems to consist in the difficulties which arose from the depreciation of the mark. These difficulties were of an extraordinary nature, such as had never before arisen in Germany, and it is easily conceivable that the persons who had to meet them did not at once see how to meet them, and did not realize at the time that their failure to do certain things promptly would result in default. I am, nevertheless, inclined to think that, even in connection with timber, there was a voluntary default within the meaning of the Treaty. The difference between the timber question and the coal question lies in the fact that the coal requirements are monthly requirements. The Germans, faced with deficits in any month, ought at once to have taken whatever precautions were necessary to see that those difficulties, whatever they were, were avoided during the next month. They failed to do this, and the deficits continued month after month.

One further juridical point arises, to which Sir John Bradbury has referred, in connection with the purpose of paragraph 17. In Sir John Bradbury's opinion, the purpose of that paragraph is to enable the Commission to appeal to the Governments only when the measures at its command have proved inadequate to enforce obedience. That is a perfectly comprehensible interpretation and explains in a large part the difference between Sir John Bradbury and his colleagues as to the action to be taken. My own

reading of paragraph 17, however, is different. In my view, the Commission is required to report any voluntary default forthwith, partly for the information of the Governments and partly to enable the Governments to take such action as they think fit. I recognize that the previous action of the Commission with respect to coal defaults has not been consistent with that interpretation, for the Commission has not automatically reported defaults as they have arisen. Although this previous practice does not, in my opinion, represent the waiver of the right, it is, nevertheless, a practical fact which should be taken into account, particularly by the Governments themselves, in whatever action they may take.

From the juridical point of view, I am of opinion that the argument put forward by the German delegation, to the effect that in private contracts a deficiency of 10 per cent does not constitute a default, is of no value. The Treaty does not contemplate the application of any such commercial custom to its provisions.

With regard to the letter of March 21, I consider that the Commission did not by its terms abandon the right under the Treaty to report a voluntary default. Nor do I think that the terms of this letter deprive the Governments of any of the rights which they derive under the Treaty from the declaration of default by the Commission. At the time when the letter was drafted I called the attention of my colleagues to the danger of the phraseology used. I do not remember exactly what views my colleagues then held, but it may be taken for granted that the phrasing would not have been accepted by certain delegates if they had thought it limited the possibility of reporting a voluntary default.

The argument to which the German delegation has attached the most weight is that concerning the needs of Germany, as indicated by her importation of nearly as much coal as she was delivering to the Allies. Legally, that argument seems to me to be applicable, not to the question of voluntary default but to the decision of the Commission as to the demands made on Germany.

The argument would have weight if used to show that the Commission's decision upon the amount of coal which Germany could supply, without undue interference with her industrial requirements, was incorrect. But the Commission's decision remains a decision unless changed, and Germany's industrial re-

quirements have nothing to do with Germany's obligation to carry out the decision, so long as it has not been changed.

But, having expressed my view of the legal situation, I desire to add that several of the foregoing considerations, particularly Germany's need for coal and her importation of coal from abroad, the previous practice of the Commission with respect to coal default, and the Commission's letter of March 21, have a practical bearing on the situation, which will naturally be taken into account by the Governments after the Commission reports a default.

The report by the Commission of the timber default seems to me to be very defective. When reporting a voluntary default, it is of the utmost importance for the Commission to report the extent of the intention which entered into that default. The Commission is the tribunal which finds the accused guilty; punishment will be meted out by another tribunal. It is, therefore, of the greatest importance that the exact nature of the crime should be reported by the Commission, so that the punishment by the Governments may fit the crime. I agree with Sir John Bradbury that the word "punishment" is not appropriate and that the real purpose of the provision is constructive. The real point is that the report should be made in such a way as to aid the Governments in adopting methods which will lead to constructive results. But it is of equal importance that the quality of the crime should be made plain in the report whether the results are to be punitive or constructive. The Commission, in its report on coal deliveries, should set forth not merely the fact of default, but also the causes of the default and all extenuating circumstances. It is only upon such a basis that the Governments can fairly perform their duty in the matter.

If I were asked to express in a few words what Germany has failed to do, I would say that Germany has failed to take those exceptional and rather extraordinary measures, month by month, which were necessary to cope with the difficulties which the experience of previous months had shown would arise.

It is understandable that Germany's opinion of her own requirements should affect her attitude. Her opinion on this point and the facts on this point are both of great importance in connection with the extent of her culpability. In that connection, it

would seem, in fairness to Germany, that the report should emphasize the percentage which expresses the real extent of the default—while the default was important from the financial point of view, as M. Delacroix has explained, the percentage of demand which Germany has not supplied is small, and this must be recognized as proving that Germany has made a very considerable effort in a very difficult matter and has attained a very large measure of success.

I have hitherto confined myself to the voluntary default on the part of Germany and the reasons which tend to lessen her culpability. If, however, I were making a report I should go further and should deal with the whole question of the failure of Germany in the execution of her obligations under the Treaty, and should explain that the conditions imposed by the Treaty have been demonstrated by experience to be impossible and that that impossibility has affected not only Germany's financial situation and her financial obligations to the Allies, but also her obligations like those in respect to coal and timber. I would further express the opinion which I have already expressed before the Commission, that the continuance of these conditions has already resulted in a great loss of money to the Allies and will result in still further loss so long as they are maintained.

The statement of Mr. Boyden was received in dead silence. Without a word of comment, M. Barthou asked that those in favor of the French proposal to declare Germany in default on coal deliveries should raise their right hands. He raised his own; then the Marquis Salvago Raggi of Italy raised his, to be followed immediately by M. Delacroix of Belgium. When the opposing vote was called for, Sir John Bradbury solemnly raised his right hand. Then came the coldly precise accents of M. Barthou: "*La proposition est adoptée.*"

It was impossible for a spectator to escape the impression that this decision had already been made in advance; that the hearing of the Germans and the discussion

among the delegates assembled constituted little more than the performance of a ritual. Sir John Bradbury, after the decision was announced, suggested—purely in his personal capacity, for he could have no official say in the matter—that in the recommendations of the Commission certain facts brought out in the discussion should be called to the attention of the Allied governments. It was decided without debate that no recommendations should be made,—only the bare notification of default.

When the decision by a majority vote—the second in the history of the Reparation Commission—was recorded, the meeting was adjourned. The following night (January 10) the *Kohlensyndikat* moved its headquarters from Essen to Hamburg, and on the morning of January 11 the French and Belgian troops moved into the Ruhr.

APPENDIX C.

LIST OF FIRMS OPERATING BEFORE THE WAR IN GERMAN LORRAINE AND LUXEMBURG *

Name of Company	Mining Conces- sions, Hec- tares	Production in 1913 1000's of Metric Tons		
		Iron Ore	Pig Iron	Steel
GERMAN LORRAINE				
<i>I—German Firms Operating also in the Ruhr and Rhineland</i>				
Gelsenkirchener Bergwerks A.G.	1,545	2,678.5	760.0	792.4 ^a
Rombacher Hüttenwerke.....	2,643	2,269.5	466.8	565.8
Ste des Hauts Fourneaux de Rumelange-St. Ingbert (Deutsch-Luxbrg.)	101	544.0	62.8	153.6
Deutsch-Luxemburgische Berg- werks A.G.	292	0	95.2	0
Bouchumer Verein für Bergbau und Gusstahlfabrikation....	203	763.7	0	0
Dillinger Hüttenwerke A.G. (Saar concern).....	692	247.6	57.9	0
Röchlingische Eisen und Stahlwerke GMBH (Saar concern)	1,349	1,379.6	179.5	0
Gebrüder Stumm	1,109	464.0	195.7	0
Thyssen et Cie.....	1,969	1,134.4	528.8	435.0 ^a
Fr. Krupp	781	421.7	0	0
Gutehoffnungshütte Oberhausen	36	123.4	0	0
Lothringen Hüttenverein Au- metz-Friede	981	1,659.1	255.0	594.3

* From a compilation of Brooks and Lacroix, Bulletin 703, U. S. Geological Survey.

Name of Company	Mining Concessions, Hectares	Production in 1913 1000's of Metric Tons		
		Iron Ore	Pig Iron	Steel
Phoenix (Hoerde) Hosch, Klockner	643	811.6	0	0
R. Bocking und Dillinger Hüt- tenwerke	888	675.3	0	0
Gebrüder Stumm und Dillinger H-werke	1,017	989.5	0	0
Phoenix Gutehoffnunshütte....	3,722	859.0	0	0
Other German Firms.....	5,561	660.3	0	0
Total German	23,532	15,681.2	2,811.6	2,286.1 ^a
<i>II—French or Mixed French and German</i>				
De Wendel et Cie. (Les petits fils de François de Wendel).	6,350	2,825.6	698.8	661.0 ^a
Other French and German Firms	152	44.0	0	0
Total	6,502	2,869.6	698.8	661.0
<i>III—Belgian Firms</i>				
Fentscher Hütten A.G.	354	0	227.5	0
Sté. Anonyme d'Ougrée-Mari- haye	199	0	0	0
Sté. de Monceau-St. Fiacre....	86	133.0	0	0
Total	639	133.0	227.5	0
<i>IV—Mixed French, Belgian and Luxemburgian</i>				
Aciéries Reunies de Burbach, Eich, Dudelange	3,631	1,042.0	0	0
Ougrée, Athus, Providence....	168	410.0	0	0
Sté. Métallurgique Sambre-Mo- selle	0	0	132.0	0
De Wendel and Aciéries Re- unies de Burbach, Eich, Dudelange	4,387	1,000.2	0	0
Total	8,186	2,452.2	132.0	0
Total in German Lorraine	35,859	21,136.0	3,869.9	2,286.1 ^a

Name of Company	Mining Concessions, Hectares	Production in 1913 1000's of Metric Tons		
		Iron Ore	Pig Iron	Steel
LUXEMBURG				
I—German Firms of Ruhr and Rhineland	2,830	Detailed data not available	1,607.9	Detailed data not available
II—Belgian Firms	135		190.0	
III—Mixed French, Belgian and Luxemburg	610		750.0	
Total in Luxemburg.....	3,575	7,331.0	2,547.9	1,182.2
Grand Total in German Lorraine and Luxemburg	39,434	28,467.0	6,416.9	3,468.3 ^a

^a In the tabulation of Brooks and Lacroix no data are given for the steel production of the De Wendel and Thyssen Companies. And yet the total steel production given in their table for German Lorraine corresponds approximately with the total given in the *Vierteljahrshefte z. Statistik d. D. Reich* 1916, III, p. 23. The above figures for the two companies are taken from *la Revue d'Alsace et de Lorraine* for July and November, 1919, and from *Comptes rendus statistiques, Numero special, l'Alsace et la Lorraine Economiques*, 1921, p. 94. The *Gelsenkirchener* firm, according to *Baedekers Jahrbuch Oberbergamtsbezirk Dortmund*, 1913-21, had no steel plants in Lorraine, and this probably accounts for the discrepancy.

APPENDIX D.

TWO RECENT STUDIES OF THE LORRAINE METALLURGICAL INDUSTRY

In the course of the year 1924 two books were published in Europe on the problems facing the iron and steel industry in Lorraine. The first to appear was by a French author, M. Henry Laufenburger,¹ entitled *L'Industrie sidérurgique de la Lorraine désannexée et la France*; the second by a German, Herr Paul Berkenkopf, entitled *Die Entwicklung und die Lage der lothringisch-luxemburgischen Grosseisenindustrie seit dem Weltkriege*.²

Since these two volumes doubtless represent important sections of thought on the subject in France and Germany respectively, it should be of interest to examine them with a view to ascertaining the extent of the difference of opinion in the two countries. This appendix, therefore, is designed to give a brief account of the studies themselves and to summarize the more important elements of the points of view which they express.

I. THE FRENCH STUDY

M. Laufenburger, in *L'Industrie Sidérurgique de la Lorraine désannexée et la France*, sets out to describe,

¹ *Docteur ès Sciences politiques et économiques.*

² Volume submitted for the doctorate in political economy at the University of Hamburg.

first, the conditions, natural, technical and economic, of iron and steel production in what was formerly German Lorraine. In the second place, he discusses the economic organization for production existing both before and after the war, while the third and last part of his study is devoted to an examination of the question of markets. The book contains 235 pages of text and a statistical annex giving some figures of iron and steel production in Lorraine and in France.

The first of the three chapters of Part I is largely taken up with an historical sketch of the origins of the iron industry in Lorraine and with a description of the natural resources of the region. The author describes the vast extent of the ore deposits and compares them with the relatively small resources in other French regions. He refers to the coal basin extending from the Saar district into Lorraine proper, to the presence of abundant water and limestone, and then calls attention to the existence, all conveniently assembled, of everything that could be desired for the production of iron and steel.

An exceedingly optimistic picture is presented, inasmuch as neither the comparatively small extent of the Lorraine coal deposits nor the difficulty of producing acceptable metallurgical coke from this coal is emphasized. The facts are set forth, but the reader is led to believe that it will be only a question of time until the coal from the Saar-Lorraine basin can be efficiently used for coke making. However, M. Laufenburger is careful to point out that the Saar district is by no means certain to be ceded to France after the plebiscite in 1935. His purpose seems to be, nevertheless, to convey an impression of completeness in the natural conditions for iron

and steel production in Lorraine which would be hardly warranted by a more thoroughgoing analysis of the fuel resources actually present.

The second chapter, on the technical methods employed in the utilization of Lorraine iron ore, is of interest chiefly because of the author's insistence upon the coking quality of the coal of the Saar basin. He asserts that the chief reasons that this coal has never been extensively employed for coke making are: first, that the industrialists of the Ruhr, being hampered by the competition of the iron industry in Lorraine, used their influence with the Prussian State (the owner of the Saar mines) to prevent their rivals from obtaining a coke supply near at hand; and second, that the German Imperial Government wished to prevent the growth of the iron and steel industry near its southwestern frontier and systematically saw to it that the coke made from Saar coal was uniformly of bad quality.³

After discussing the technical difficulties of producing good coke from the coal of the Saar and expressing the confident hope that those difficulties will be overcome, the author then discusses the possibility of reducing the requirements for coke in the metallurgical process. Certain methods, such as the use of raw coal and the introduction of electric smelting, are mentioned; but no predictions are ventured as to the actual saving that may be expected. While the future is optimistically portrayed, attention is

³ Not only M. Laufenburger, but Engerand and other French writers seem to be firmly convinced that the Lorraine industry was discriminated against by the German Government. The fact that the greater part of the Lorraine firms were identical with Ruhr concerns before the war and that the Lorraine industry actually did develop very rapidly does not seem to be sufficient to change their conviction.

nevertheless called at the end of the chapter to the fact that for the present Lorraine désannexée is still dependent upon imports for over 90 per cent of its coke supply, and that 2,305,000 tons out of the total consumption in 1922 of 2,838,000 tons came from Germany.

In the final chapter of Part I, M. Laufenburger discusses the economic conditions under which Lorraine is supplied with coke. After outlining the provisions incorporated in the Treaty of Versailles and the part to be played by the Reparation Commission, he reviews the methods actually employed in obtaining coke deliveries. In this connection a very much simplified picture is presented. According to the author the system of comparatively voluntary deliveries by Germany on the reparation account was tried for four years (1919-22) after the Armistice. Since this method proved to be unsatisfactory, the French Government at the beginning of 1923 instituted a system of direct control of the coke supply by the occupation of the Ruhr. Although no immediate improvement was obtained, M. Laufenburger declares that it is as yet too early to appraise the last method. He calls attention, however, to the advantage of the more direct relations between the Ruhr and Lorraine established by the occupation.

But the most interesting portion of this chapter is the author's discussion of the future coke supply of the Lorraine iron industry. He does not conceal his belief that the system of reparation deliveries offers no permanent solution of the problem. Two methods of achieving a solution with respect to necessary supplies from Germany are discussed. The first is the system of exchanges of iron ore for coke, which should be employed only as a

last resort. M. Laufenburger urges instead that the exchanges should be pig iron or steel against coke, and the arguments he presents are perfectly sound and logical from the French point of view.⁴

The second method which the author considers is industrial participation between the Ruhr and Lorraine. He declares that until the reparation debt is completely paid this solution of the problem is not to be envisaged. Moreover, he points out that whatever may eventually be accomplished in this direction, any possible arrangement "will always have only a relative and precarious value on account of the existence of a frontier between the iron ore and the coal deposits." Consequently, France must not under any circumstances look to the Ruhr for her permanent coke supply. She must instead render herself independent of Germany.

When M. Laufenburger comes to consider the means by which France is to become independent of the German coke supply, the difficulty of maintaining a high degree of optimism becomes apparent. The supplies obtainable to date from other sources are merely noted, and it is manifest that as far as coke as distinguished from coal is concerned, the task is hopeless. It is at this point that the author makes what is probably the most constructive proposal of his book. He urges that the Lorraine metallurgical plants install their own coke ovens and thus become dependent merely upon imported coal. The one discordant note in this scheme is that an adequate supply of good coking coal is economically

⁴For a discussion of the difficulties in the way of such an arrangement—caused by the German foreign trade requirements—see discussion in Chapter IX of this book.

available only in the Ruhr, although even under such conditions the advantages of making coke on the ground are so great that M. Laufenburger's proposal should unquestionably be adopted.

In the second part of his study the author takes up in considerable detail the actual state of affairs in the Lorraine metallurgical industry with respect to the economic organization for iron and steel production. The methods employed by the French Government in transferring the ownership of the plants is discussed and the new situation is contrasted with the old. It is pointed out that the former vertical combinations have been broken up and replaced by a system defined as *concentration*, wherein the Lorraine plants have been parcelled out among various groups of French concerns. M. Laufenburger does not hesitate to criticize the French Government for the manner in which the new economic organization was imposed upon the Lorraine iron industry, although he has no thoroughgoing alternative to propose, except perhaps that the Lorraine firms should be given a wider control in the management of the French iron industry as a whole.

The discussion in this part of the study is of interest chiefly to the student of French business administration for its own sake. A description of the great De Wendel concern is included as well as an account of a visit to the modern iron and steel plant built just before the war by the Thyssen Company at Hagondange. However, since the subject matter dealt with has little bearing on the international problem with which we are primarily concerned, we shall not stop to examine it further. It will be more profitable, rather, to devote the rest of our space

to an account of the author's discussion of the problem of markets.

M. Laufenburger begins the discussion of markets by summarizing the present capacity of France and the Saar district to produce iron and steel, on the one hand, and the consuming capacity of the new France on the other. He estimates that on the basis of the consumption of the same territory in 1913 there can be produced annually an excess of 850,000 tons of cast iron (*fonte de moulage*) and 4,558,680 tons of iron and steel (on the basis of steel ingots). Thus France, including Lorraine and the Saar, must find markets, either at home or abroad, for 5,408,680 tons of iron and steel over and above the estimated normal needs of the territory under her control, if she is to take full advantage of her present productive capacity. The author then sets himself the task of examining the possibility of developing the necessary new markets.

After comparing the relative importance of finding new markets respectively at home and abroad, he concludes that intensive efforts must be made to develop both, although the greater stability and regularity of home markets is pointed out. An analysis is then presented of the prospects for increasing iron and steel consumption in France. The consumption per capita has hitherto been comparatively low because France has not been an industrial nation. What the author fails to emphasize is that the lack of industrial development is very largely due to an insufficient supply of fuel for power production. However, he mentions various industries—the electrical and hydraulic development of the future, the manufacture of automobiles, and the like—which may be expected

to consume large quantities of iron and steel in the years to come, and estimates that consumption in France can be increased by more than 2,000,000 tons a year.

This estimate is based on a report of the President of the Committee of Arts and Manufactures submitted to the French Minister of Commerce, who foresees an increase of 75 per cent in the production of machinery, which will require 1,000,000 tons annually of additional steel, and an increase of steel construction requiring some 400,000 tons. Since the predictions are not accompanied by detailed figures, it may be suspected that they are in the nature of an expression of hopeful optimism. Even though they should be realized, however, there still remains the necessity of finding markets abroad for some 3,000,000 tons of metal per annum.

M. Laufenburger then proceeds to examine the possibility of developing new foreign markets. A survey of the export trade since the war reveals the fact that the principal customers of France are Belgium, Germany and Great Britain, and the author calls attention to the fact that the bulk of the exports have consisted of either crude or half-finished metal. He urges that an effort should be made to change this, but recognizes the seriousness of the competition to be anticipated from German, British and Belgian concerns which turn out finished products.

No predictions are ventured as to the quantities of iron and steel that may eventually be sold in the European markets. The author merely calls attention to certain possibilities in Holland and the Scandinavian countries and in Italy and Spain, for the sale of metallurgical products, and inquires rather wistfully if France is not to attempt participation in those markets. The chances

of overseas shipments are mentioned, and considerable hopes are held out for disposing of iron and steel in the French colonial trade. The general impression conveyed by the number of prospects mentioned is that while the metallurgical industry must be on the alert and employ vigorous selling methods, the situation is in the aggregate hopeful.

While the author does not fail to mention the normal dependence of the new French iron and steel industry upon German markets for about one-fourth of the normal output and about half of the normal exports, he does not emphasize these elements of the situation. The reader is encouraged to believe that all will come out right in the end if only the French Government and the metallurgical concerns will follow a wise policy with respect to the export trade.

In outlining what that policy should be, M. Laufenburger suggests a sane and well-considered program. The transport system, both rail and water, should be improved in the interest of a proper distribution of raw materials and of facilitating access to the markets at home and abroad. A comprehensive system of liberal commercial treaties should be negotiated, and the point is emphasized that France must increase not only her exports but also her imports. M. Charles Rist is quoted to the effect that "to conquer new markets, we must ourselves consent to be conquered. For each new market that is opened before us, we must open a little more our own markets to the products and the work of foreigners."⁵ Finally, the author recommends the adoption in France of more efficient selling agencies. He believes that some-

⁵ *Revue économique et parlementaire*, March 10, 1924.

thing on the order of the German cartels will best meet the needs of the situation.

General Impressions of the Study.

M. Laufenburger's point of departure seems to be the assumption that France must take full advantage of her opportunities to become an iron and steel producing nation rivaling Great Britain and Germany, and that in the main France must strive to attain the maximum degree of independence of Germany or any other foreign power. In order to present an exposition of his subject wherein this will be possible he appears to find it necessary to take an unduly optimistic view of the double problem of fuel supply and markets. Perhaps the most serious criticism of his book is in connection with the failure to emphasize the seriousness of these two elements of the situation. In common with many other writers on the post-war economic position of France he seems to feel called upon to emphasize the optimistic features while giving the reader the impression that the difficulties in the way are but incidental and temporary.

II. THE GERMAN STUDY

According to Herr Berkenkopf, in *Die Entwicklung und die Lage der lothringisch-luxemburgischen Gross-eisenindustrie*, the occupation of the Ruhr opened a new chapter in the Lorraine-Luxemburg iron industry—a chapter not yet ended. The book deals therefore only with the developments up to the end of the year 1922. The volume contains 258 pages of text and 41 tables and graphic supplements.

The factors with which Herr Berkenkopf concerns him-

self are, first, what may be termed the fixed elements, that is, the location of the natural resources of Lorraine and Luxemburg. He deals, in the second place, with the factors which are superimposed on the natural conditions by the prerogatives appertaining to government and industrial exploitation. The complexity resulting from the interplay of these various factors has resulted in a problem which, the author ingenuously remarks, "cannot be solved by arithmetic."

That part of Herr Berkenkopf's study which deals with the natural conditions is of no particular interest here, inasmuch as the same ground has been covered in the text of this book. In contrast to the study of M. Laufenburger, the author is at particular pains to emphasize the fact that the coke supply is the crux of the French problem. He declares, moreover, that this has not been fully appreciated in France, although it is highly probable that the leaders of the French metallurgical industry would not agree with this contention.

Herr Berkenkopf also takes up the new situation of the Luxemburg metallurgical industry and concludes that the Grand Duchy may look forward to even greater difficulties than France. He discusses at great length the absolute dependence of Lorraine and Luxemburg upon Germany for a supply of coke and coking coal. Special attention is also called to the manner in which the iron industry of the Ruhr has rendered itself for the present practically independent of Lorraine for its ore supply, by making far-reaching arrangements for the import of higher grade ores from other sources. Thus Lorraine is much more dependent upon the Ruhr than the Ruhr upon Lorraine.

One point emphasized by the author in connection with the coke supply is particularly worthy of note. The delivery of coke on the reparation account, he declares, has had the effect of preventing France from developing her own coke production, although he makes it clear that under no circumstances will France be able to render herself independent of the Ruhr.

The difficulties of France and Luxemburg in finding markets for their iron and steel output are discussed and analyzed, and the conclusion is drawn that the dependence upon Germany in this respect is almost as serious as in the matter of the coke supply. Attention is called to the fact that whereas in the past France was accustomed to consider the export trade merely as an exceptional method for disposing of a temporary surplus of production, she is now obliged to consider this quite as important as her domestic markets. It will not be profitable, however, to give further attention to the author's detailed analysis of the problems of production and distribution in Lorraine and Luxemburg. A brief account of his summary will perhaps give a better indication of the German point of view.

Herr Berkenkopf takes the position that France, by the very nature of her pre-war industrial policy, was ill-equipped to carry on the disrupted economic system in Lorraine. The French iron and steel industry, he declares, has always lacked the urge for industrial expansion that has been more positively present in other countries. In the author's opinion, the typical trend of thought of the French people has been discernible in the heavy industries; and the result of that trend of thought has been that the iron and steel industry has not been

able to overcome a certain stagnation. Reference is made to M. Delaisi's observation that there may have existed some concern in France over the possibility that the rapid development of the iron and steel industry would too suddenly convert France from an agrarian to an industrial state. The author doubts, however, that this motive consciously influenced the pre-war development to the extent which M. Delaisi assumes.

The policy of the French iron industry in regard to production and distribution was centered wholly on the domestic market, from which a prohibitive tariff barred foreign competition and permitted the maintenance of a high price level. A heavy burden thus rested on the finishing industries, and under such conditions the iron industry was not greatly interested in increased production for the export trade, which was regarded chiefly as a safety valve for occasional overproduction.

The outcome of the war and the annexation of the Lorraine and Saar metallurgical plants caused a complete revolution, and the export trade came to be of vital importance. The annexation of these two industrial groups has had also a strong influence on the internal structure of the French iron industry. Various clashes of opposing interests have come to the surface in the Comité des Forges. The Lorraine firms, under the leadership of the De Wendel Company, and the group of central France, with the Schneider Company at its head, have been in frequent conflict over the policy to be adopted toward Germany and the German mining industry. The Lorraine firms have urged moderation in contrast to the intransigence of the central group.

Herr Berkenkopf declares that the outcome of the war

has noticeably changed the habits of thought of the French people, particularly in industrial circles. He declares that it is impossible not to observe a turning away from the idea of economic Malthusianism, although he doubts whether this is permanent in a country whose movement of population is so conspicuously stagnant. Pronounced economic expansion for any length of time he does not consider likely.

Reaction has already set in, the author declares, from the early optimism of the Comité des Forges. There was at first a tendency to forget some of the factors of the situation which are now beginning to be felt. These factors were the destruction of markets and the great reduction of purchasing power in general, but above all, the reappearance of German competition, which, it was believed, had been incapacitated for years to come. Then the coke problem began to assume its full importance. For a few years the reparation deliveries made France secure; but after that she would be utterly dependent upon German coke producers, who, moreover, would be also her chief competitors in the iron and steel markets of the world.

The only recourse which France would have in case Germany should cut off the coke supply would be to stop the delivery of Lorraine ore. This would be ineffective, because for years to come Germany has rendered herself practically independent of the *minette* ores.

Various ways out of the dilemma have been sought. The author declares that the most natural, and, economically, the only possible way, was a direct approach to the German iron industry with a view to bringing about an amicable understanding. This was attempted and failed.

A second way was the international cartel suggested by M. Delaisi. This, too, was attempted, and it, too, failed. The third way, which seemed to solve both the coke and the market problem at one fell blow, was to take possession of the Ruhr coal. Herr Berkenkopf declares that from the beginning this way had strong supporters in the Comité des Forges, and that the political plans of Poincaré were in the same direction.

The bulk of Herr Berkenkopf's book was written in 1923 when the struggle in the Ruhr was still going on. He concludes his study with the prediction that, following the eventual withdrawal of their troops, French interests would take decisive steps to solve the double problem of markets and fuel still facing them. Possibly they might attempt to gain a foothold in the Ruhr iron industry or to bind it in long term agreements.

It is pointed out by the author that Lorraine no longer has the same importance for the Ruhr as formerly, either in regard to the *minette* supply or even in regard to the supply of semi-finished iron and steel. If reciprocal overtures for the entry into closer relations should take place, they must be on the basis of the new conditions. As far as the Ruhr iron industry is concerned, it can participate in a purely economic arrangement only when both participants have a recognized equal status.

General Impressions of the Study.

From the point of view of the international problem arising out of the disruption of the Ruhr-Lorraine industrial system, the most significant passages of Herr Berkenkopf's book are those which undoubtedly express opinions widely held in Germany. These are, first, the

tendency to belittle the economic importance of the Lorraine iron deposits, now that they are lost to Germany, and second, the popular belief that the French people are not capable of carrying out an extensive program of industrial expansion. In addition, the author discloses an unmistakable awareness in Germany of the stronger economic position held by the Ruhr iron and steel industry. On the whole the book tends to demonstrate the necessity of a wider comprehension in Germany of the French point of view and a somewhat less nationalistic attitude towards the industrial development of the future.

BIBLIOGRAPHY

Books and Special Articles.

- BAINVILLE, JACQUES, *Les Consequences Politiques de la Paix*, Paris.
- BASS, J. F. and MOULTON, H. G., *America and the Balance Sheet of Europe*, New York, 1921.
- BARUCH, B. M., *The Making of the Reparation and Economic Sections of the Treaty*, New York, 1920.
- BERKENKOPF, PAUL, *Die Entwicklung und die Lage der lothringisch-luxemburgischen Grosseisenindustrie*, Jena, 1924.
- BROOKS, A. H. and LACROIX, M. F., *Iron and Associated Industries of Lorraine, the Sarre District, Luxembourg and Belgium*, Bulletin 703, U. S. Geological Survey, 1920.
- BURNIE, R. W., *Memoirs and Letters of Sydney Gilchrist Thomas, Inventor*, London, 1891.
- DELAISI, F., "The Comité des Forges de France," *Manchester Guardian Commercial*, May 31, July 12, Aug. 16, and Nov. 1, 1923.
- DILLON, E. J., *The Peace Conference*, London, 1919.
- ECKEL, E. C., *Coal, Iron and War*, New York, 1920.
- ENGERAND, F., *Le Fer sur une Frontière*, Paris, 1919.
- GREAU, E., *Le Fer en Lorraine*, Paris, 1908.
- HAUSER, H., *Les Méthodes allemandes d'expansion Economique*, Paris, 1917.

- KEYNES, J. M., *The Economic Consequences of the Peace*, London, 1919.
A Revision of the Treaty, London, 1922.
- LAMONT, THOMAS, W., *What Really Happened at Paris*, New York, 1920.
- LAUFENBURGER, H., *L'Industrie Sidérurgique de la Lorraine Désannexée et la France*, Strasbourg, 1924.
- LAYTON, W. T., "The Steel Industry and International Politics," *The Nation and the Athanaeum*, London, June 9, 1923.
- LEVY, R. G., *La Juste Paix; ou, la Vérité sur le Traité de Versailles*, Paris, 1920.
- LIEFMANN, R., *Kartelle und Trusts und die Weiterbildung der Volkswirtschaftlichen Organization*, 6 ed., Stuttgart, 1924.
- MILLIoud, *La Caste Dominate Allemande*, Paris, 1916.
- MOULTON, H. G., *The Reparation Plan*, New York, 1924.
- MOULTON, H. G., and MCGUIRE, C. E., *Germany's Capacity to Pay*, New York, 1923.
- NITTI, F., *The Decadence of Europe*, Eng. Ed. New York, 1923.
- OLIVIER, M., *La Politique du Charbon 1914-1921*, Paris, 1922.
- PINOT, R., "The Policy of the Comité des Forges," *Manchester Guardian Commercial*, Oct. 25, 1923.
- REPARATION COMMISSION, *Report on the Work of the Reparation Commission*, Vols. I-VI, London and Paris, 1922 and 1923.
- SCHUMACHER, H., *Die West Deutsche Eisenindustrie und die Moselkanalizierung*, Leipsig, 1910.
- STOCKDER, A. H., *German Trade Associations*, New York, 1924.

- TARDIEU, A., *La Paix*, Paris, 1921.
- TOSDAL, H. R., "The German Steel Syndicate," *Quarterly Journal of Economics*, February, 1917.
- WALKER, FRANCIS, *Monopolistic Combinations in the German Coal Industry*, New York, 1904.
- "The German Steel Syndicate" *Quarterly Journal of Economics*, May, 1906.

Periodicals

- Colliery Guardian, London.
- Commerce Reports (U. S. Department of Commerce, Washington, D. C.)
- Economist, The, London.
- Economiste Européen, Paris.
- Glückauf, Essen.
- Iron and Coal Trades Review, London.
- Iron Trade Review, Cleveland, O.
- Journée Industrielle, Paris.
- Kartell Rundschau, Karlsruhe.
- Manchester Guardian Commercial, Manchester.
- Quarterly Journal of Economics, New York.
- Revue de l'Industrie Minérale, Paris.
- Stahl und Eisen, Düsseldorf.
- Statist, London.
- Wirtschaft und Statistik, Berlin.

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